HANDBOOK

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Tactics, Techniques and Procedures

CENTER FOR ARMY LESSONS LEARNED (CALL)
U. S. ARMY TRAINING AND DOCTRINE COMMAND (TRADOC)
FORT LEAVENWORTH, KS 66027-1350

FOREWORD

This handbook is part of a TRADOC CG initiative to provide units with lessons from past conflicts and from current operations that are relevant to the Contemporary Operational Environment. The handbook provides tips and tactics, techniques, and procedures from several sources, including current operations in the ENDURING FREEDOM AO as well as Desert Shield/Desert Storm, Panama, Somalia, and the Republic of Vietnam.

U.S. military operations today and the near future will involve more dynamic, multi-spectrum threats and challenges than in the past. We will face a variety of possible adversaries with a wide range of technology levels, strategies, operational tenets, and tactics. This range of threats encompasses large, modernized conventional forces as well as smaller, lower-technology forces using more adaptive, asymmetric methods. Thus, the COE presents challenges that stretch our combat power in ways we have never before encountered.

Understanding the nature of the COE and of specific environments encountered in ENDURING FREEDOM is essential to stressing the planning capabilities of brigade and battalion staffs and sharpening the critical skills demanded of Army leaders. To succeed in the COE, soldiers must be able to protect themselves from various and sometimes unpredictable threats, while exploiting enemies' weaknesses.

This handbook is designed for your use and dissemination. If your unit has identified other relevant lessons or information, please share them with the U.S. Army by contacting CALL at DSN 552-2255 or 3035, commercial (913) 684-3035, or FAX DSN 552-9564. Our e-mail address is: call@leavenworth.army.mil and our WWW homepage is: http://call.army.mil. Ensure that you include your phone number and complete address.

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OPERATION ENDURING FREEDOM

TACTICS, TECHNIQUES AND PROCEDURES

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Unless otherwise stated, whenever the masculine or feminine gender is used, both are intended.

CALL has many products of interest to the Total Force. A partial listing may be found at the back of this publication. We invite you to visit our web site at:

The intent of CALL publications is to share knowledge, support discussion, and impart lessons and information in an expeditious manner. This CALL publication is not a doctrinal product. The tactics, techniques, and procedures (TTP) observed and reported in this publication are written by soldiers for soldiers. If you have, or your unit has, identified other relevant TTP for the U.S. Army, contact the Managing Editor, Dr. Lon Seglie, at Coml (913) 684-3035 or DSN 552-3035; FAX DSN 552-9583. E-mail address is: Lon.Seglie@leavenworth.army.mil. Articles must be submitted in either Word Perfect or Word format. Graphs, slides, and clipart **must be submitted separately from the document** in either ppt, pcx, or wpg format.

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CHAPTER I: The Contemporary Operational Environment (COE)

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SECTION I: INTRODUCTION

At the direction of the Chief of Staff Army and the Commander, U.S. Army Training and Doctrine Command (TRADOC), the TRADOC Office of the Deputy Chief of Staff for Intelligence (ODCSINT) has studied the nature of current operational environments and those of the foreseeable future. The DoD officially defines an *operational environment* as "a composite of the conditions, circumstances, and influences that affect the employment of military forces and bear on the decisions of the unit commander" (Joint Pub 1-02).

The contemporary operational environment (COE) is the overall operational environment that exists today and in the near future (out to the year 2020). The range of threats during this period extends from smaller, lower-technology opponents using more adaptive, asymmetric methods to larger, modernized forces able to engage deployed U.S. forces in more conventional, symmetrical ways. In some possible conflicts (or in multiple, concurrent conflicts), a combination of these types of threats could be especially problematic.

Basic to understanding the nature of this COE are the following premises:

- The United States will have no single peer or near-peer competitor until 2020 or beyond.
- Nation-states will remain principal actors in the global political arena, but non-state actors (including transnational actors) will increasingly take prominent positions in world affairs. Such non-state actors will play important roles in any conflict – as combatants or noncombatants.
- Nations will continue to field armed forces and use them as tools to pursue national interests. Entities other than nations will also pursue their own interests (which may be ethnic, religious, economic, or political) through force or by other means, either independently or in conjunction with other non-state or nation-state actors.
- As nation-state or non-state actors pursue their own interests, their actions may cause U.S. intervention, either unilaterally or as a coalition partner, with or without United Nations mandate.
- Nations that believe the United States will act counter to their national interests will develop diplomatic and military plans for managing U.S. intervention.
- Nations will modernize their armed forces within the constraints of their economies, but based on an investment strategy of upgrading their conventional forces for possible use against regional foes and developing adaptive, niche technologies for possible use against extraregional foes such as the United States.
- The rapid development and proliferation of advanced technology will make such technology available on the world market for a wide variety of nation-state and non-state actors.
- All combat operations will be significantly affected by a number of variables in the environment beyond simply military forces.

SECTION II: CRITICAL VARIABLES

During the period covered by the COE, the Army will encounter a variety of conflicts in a number of different operational environments. There are eleven critical factors or variables that define the nature of the operational environments in which those conflicts or other U.S. military activities may occur. These factors are "variables," because the exact nature of the conditions, circumstances, and influences that make up the operational environment will vary according to the particular situation. The variables are:

- **Physical environment**
- **Nature and stability of the state**
- **Military capabilities**
- **Technology**
- **Information**
- **External organizations**
- **Sociological demographics**
- **Regional and global relationships**
- **National will**
- **Time**
- **Economics**

These variables are interrelated and sometimes overlap. Different variables will be more or less important in different situations, but they are all common to any operational environment. Nevertheless, the collective content of these variables will define any operational environment the Army could face, whether we are involved in stability and support operations, smaller-scale contingencies, or major theater war.

In real-world operational environments, soldiers and leaders must be aware of the variables representing the "conditions, circumstances, and influences" that affect military operations. In Army training environments, these variables and effects must, therefore, be present to provide realistic and relevant training.

Each operational environment is different because the content of the variables is different. However, there are some common characteristics we can expect to find in any operational environment that exists between now and the emergence of a peer competitor. Only by studying and understanding these variables and incorporating them into our training can we keep adversaries from using them against us or find ways to use them to our own advantage.

SECTION III: ASYMMETRIC, ADAPTIVE APPROACHES

The concept of asymmetric warfare is critical to understanding the COE. Nations and non-state actors in various regions of the world generally see the United States as a major international power, with large technological, economic, and material advantages and an overwhelming military capability. Given this strategic assessment, potential opponents will seek to avoid U.S. strengths while exploiting perceived U.S. weaknesses. In this way, they hope to achieve their own regional goals without U.S. intervention or, failing this, without the U.S. defeat of those objectives. If it comes to a fight with U.S. forces, they are not going to fight the same way they would fight their peers or lesser forces in their region.

Asymmetry is a condition of ideological, cultural, technological, or military imbalance that exists when there is a disparity in comparative strengths and weaknesses. In the context of the COE, asymmetry means an adaptive approach to avoid or counter U.S. strengths without attempting to oppose them directly, while seeking to exploit weaknesses.

While an asymmetric approach is not new, potential opponents will increasingly study and prepare for U.S. strategy, tactics, and capabilities. They will invest in technologies that negate U.S. strengths, but not necessarily in a direct, symmetrical way. They will use force design and investment strategies that allow them to achieve regional goals while preparing for the eventuality of U.S. intervention. Various countries and non-state entities have studied how the United States fights and have begun to devise ways to fight a technologically superior force, if necessary, and win.

SECTION IV: THREATS AND OTHER INFLUENCES

In today's world, the U.S. Army must be prepared to go into any operational environment and perform its full range of missions while dealing with a wide range of threats and other influences. Some threats come in the form of nation-states; this may be a country or a coalition

of countries. Threats can also come from entities that are not states; these can include insurgent, terrorist, drug-trafficking, and other criminal organizations. These non-state actors may use force of arms to further their own interests and threaten the interests of the United States or other nation-states. Non-state threats may exist in isolation or in combination with other non-state or nation-state threats.

No single nation-state or non-state actor is expected to present a peer or near-peer threat to the United States until 2020 or beyond. However, this does not mean that the United States and its armed forces will not face serious challenges in the next two decades. The sum total of all the possible conflicts and the level of difficulty of those conflicts could present a challenge equivalent to that of having a near-peer competitor. For example, the net effect of the operational environments in Afghanistan, the Philippines, and in other areas where U.S. forces might be committed in the near term well expresses the challenge posed by the COE. Thus, when considered in its totality from a global, strategic perspective, the COE stretches our combat power in ways we have never before encountered.

We must be ready to counter all possible threats and, at the same time, be prepared to deal with various third-party actors, such as international humanitarian relief agencies, news media, refugees, and civilians on the battlefield. These groups may not be hostile to us, but they can affect our ability to accomplish our mission when we are operating in a foreign country. Their presence can change or constrain the nature of the conflict and can influence the outcome.

Most nations of the world and other actors of consequence have devoted considerable effort to studying the United States and how we fight. Since it is difficult for us to predict whom we might have to fight, we don't always have the luxury of having studied them in detail. So, it is quite possible that the enemy may know more about us than we know about them.

SECTION V: WARFIGHTING IN THE COE

Given this overall situation, what does all this mean for future warfighting involving U.S. forces? Warfighting in the COE may transcend the traditional definitions of what constitutes "war" or "victory."

Most of the participants in conflicts around the world would not start out with the intent to fight the United States, so they are looking for ways to keep us out of the conflict or keep us from staying involved. If it does come to a fight, they are not going to fight us the same way they would fight their peers or lesser forces in their region. Thus, we can expect potential adversaries to adapt their methods of fighting, most likely using a combination of the following principles:

- **Control access into the region**
- **Change the nature of the conflict**
- **Employ operational shielding**
- **Control tempo**
- **Neutralize technological overmatch**
- **Cause politically unacceptable casualties**
- **Allow no sanctuary**

These principles attempt to exploit weaknesses or vulnerabilities believed to exist in the U.S. force's activities, force structure, or rules of engagement (ROE). Many of these principles are interrelated and overlapping, since all contribute to the overall goal.

Initially, potential opponents will seek to selectively deny, delay, and disrupt entry of U.S. forces into their region. Even if the opponent can't deny the U.S. access, he will seek to control it. Meanwhile, the time required for any phased U.S. deployment affords the enemy the opportunity to begin changing the nature of the conflict to something for which the U.S. force is least prepared once it gets there.

The enemy will begin to use operational shielding to protect key elements of his combat power from destruction – particularly by U.S. air and missile forces. This protection may come from use of any or all of the following: dispersion, complex terrain, fortifications, countermeasure systems, information warfare, and the risk of unacceptable collateral damage or noncombatant casualties.

During the initial phases of U.S. entry, the enemy may employ a high operational tempo, taking advantage of the weaknesses inherent in U.S. power projection. As U.S. forces gain a foothold in the region, the enemy may slow the tempo to prolong the conflict, taking advantage of a perceived lack of U.S. commitment over time. He will try to survive tactically and operationally long enough to win strategically. For the enemy, a stalemate may be good enough, as long as he maintains enough power to live to fight another day.

As our adversaries focus on preserving their own combat power, they will try to neutralize our technological overmatch, particularly our long-range, standoff precision fires. They will not mass their forces in predictable linear patterns of echelonment and timing. Rather, they will disperse forces in areas of physical or moral sanctuary often located in urban or other complex terrain and shielded by civilians and manmade structures. Then they will use maneuver tied to opportunity, massing forces and fires from dispersed positions at a time and place of their own choosing. At the tactical level, there is a high likelihood of close combat in urban environments or other complex terrain. In specific tactical situations, the enemy might be able to employ a niche technology to create parity or overmatch U.S. forces deployed in that particular area.

The enemy will not avoid combat, but will seek battle in urban environments and other complex terrain that may be better suited for his forces than ours. Since we are fighting in his region, he may also have the advantage of being more familiar with the terrain and other features of the environment than we are. He will be looking for conditions or creating conditions advantageous for using his forces at the time and place of his choosing. When opportunities arise, he will use these forces to destroy high-visibility U.S. targets and cause politically unacceptable casualties. Thus, his targeting of U.S. systems and personnel is not always linked to military-style objectives, but often aimed at creating a psychological effect.

The enemy will seek to deny U.S. forces safe haven during every phase of deployment and as long as they are in the region. He is prepared to attack U.S. military and civilian targets anywhere on the battlefield, in the region, or even in our homeland.

SECTION VI: COE IN THE TRAINING ENVIRONMENT

In U.S. Army training environments, the COE is the environment created by the opposing force (OPFOR) that portrays the military and/or paramilitary forces of a composite of potential adversaries and by manifestations of other COE variables in models and simulations, curriculum in training institutions, and the manning and equipping of training centers. Army training must contain sufficient manifestations of the COE variables to provide realistic conditions that challenge our leaders, soldiers, and units, to produce certain training outcomes desired for the legacy, interim, and objective force.

Another way to deal with U.S. technological overmatch is the use of military systemology – a warfighting concept that attempts to destroy or neutralize systems as opposed to formations or weapons platforms. Our military is a system of systems, and opponents will seek to disrupt or destroy the links and nodes that provide the synergy of our system of systems.

The training venues include combat training centers (CTCs) and home station training for units and institutional training (primarily in TRADOC schools) for soldiers and leaders. Models and simulations provide the driver for most training. In CTCs, as well as in home station training, the COE is the environment created by exercise design and manning and equipping of the centers to provide realistic conditions in which units train mission essential tasks to standard. Unit training must have sufficient manifestations of the COE variables (live or simulated) to realistically challenge the unit's ability to accomplish those tasks. In leader and soldier training, training institutions must also have sufficient manifestations of COE variables in their curriculum, scenarios, and programs of instruction to produce the desired leader and soldier training outcomes.

The goal of COE implementation in Army training is to produce an objective force of leaders, soldiers, and units capable of rapidly adapting and optimizing capabilities to achieve mission objectives – to fight and win – in a complex and evolving environment across the spectrum of conflict. COE implementation is less about equipping and organizing our training venues to reflect the COE and more about seeing warfare through a different lens.

CHAPTER II: Universal and Enduring Techniques and Procedures to Support Tactical Operations in Afghanistan (Desert Environment)

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SECTION I: BOS TIPS ON FIGHTING IN THE DESERT

The desert is harsh; living conditions can be extremely uncomfortable; the desert can easily kill an unprepared soldier. The desert can pose a constant challenge to every soldier, and each must be physically, mentally, and professionally prepared to meet this challenge.

INTELLIGENCE

- Distances require longer lead times for reconnaissance and surveillance planning. Effective reconnaissance takes time.
- To confirm the intelligence template, if possible, reconnaissance must identify (six digit accuracy) approximately 80 percent of the enemy antitank systems.
- Scouts are reconnaissance patrols, not combat patrols, and should attempt to gain information through stealth.
- Consideration should be given to conducting reconnaissance during periods of limited visibility.
- Very few civilians are encountered in desert operations, and information they give should be treated with caution.

MANEUVER

- When moving in the desert, cover can only be provided by terrain masking because of the lack of heavy vegetation or manmade objects.
- Because there is little vegetation in the desert, strong shadows are readily observed from the air. Disrupt shadows by altering the shape of equipment, using the correct angle to the sun to minimize shadow size and to cause shadows to fall on broken ground or vegetation whenever possible.
- Dig in equipment and use overhead cover or camouflage nets to reduce shadows.
- Move vehicles and equipment as the sun moves.
- Shade optics to prevent shine.
- Open terrain and predominantly clear atmosphere generally offer excellent long-range visibility, but at certain times of the day it may be limited or distorted by the effects of heat.
- The ideal observation should have the sun behind it and be as high as possible to lessen the effects of mirages and heat radiation from the ground.
- Stake out your target line/engagement area (trigger point). This will prevent soldiers from engaging targets beyond the maximum effective range of the weapon system.
- Observation of fires may be difficult. The lack of visible terrain features distorts the ability to make range estimations.
- When preparing defensive positions, use every available means to know how far you can observe in front of your positions.
- The enemy can see just as far as you can. Inspect your position from an enemy point of view.

- Light and noise at night may be seen or heard from miles away, so strict light and noise discipline are necessary.
- Sand and dust reveal movement in the desert. It is best to move at night. This includes resupply as well as tactical movements.
- There are fewer terrain features in the desert. This hinders navigation and exposes friendly forces to the enemy.
- Take advantage of the least considered features, such as wadis, to conceal movement.
- The enemy will try to attack with the sun low and behind him in an attempt to dazzle the defender.
- Always camouflage positions.

FIRE SUPPORT

- Firing tables at altitude are inaccurate and need to be redone.
- Artillery ammunition storage and handling is very important in a dry, hot environment.
- Very hot ammunition will affect the ballistic solution, which will cause the round to impact long or short of its intended target.
- Digging in storage positions for ammunition will keep it cooler.
- Illumination or smoke rounds can be used to reorient maneuver forces.

MOBILITY/COUNTERMOBILITY/SURVIVABILITY

- When natural obstacles are not available, units should use linear obstacles to stop enemy movement.
- Minefields must be rapidly laid over large areas to be effective.
- The enemy will try to attack with the sun low and behind him in an attempt to dazzle the defender.
- Employ "basic loads" of Class IV (sand bags, pickets, etc.) with all vehicles to expedite digging in.
- In the desert environment, camouflage and dispersion are a necessity for all forces.
- Employ reverse slopes as much as possible and camouflage frontal parapets for individual/crew positions. This avoids obvious bunker positions being easily seen and destroyed by direct fire.
- Extended depth and dispersion of vehicles will enhance chances of survival.
- Armored vehicles survive longer when dug in.
- Use of dummy positions can conceal operational plans to deceive the enemy as to the real location of potential targets, such as fighting positions or trains areas.
- Air instability is most likely to cause quick, vertical, and irregular dissipation of an agent, leaving the target area relatively free of contamination quickly.
- Chemical weapons used during the heat of day are normally persistent nerve or blister agents.

COMBAT SERVICE SUPPORT

- Medical support in the desert environment is challenged by remote locations.
- In a nonlinear desert defense, enemy and friendly units may be intermingled, especially in poor visibility.
- Medical treatment and evacuation will become more critical in the desert. The effectiveness of the combat lifesaver program has been proven.
- Medics must constantly re-certify and train those who are designated as combat lifesavers. The standard should be at least one lifesaver per squad.
- Rehearse how your unit will identify, treat, and evacuate casualties. This is as important as how you will fight.
- When not in use, keep weapons covered. Even though weapons are covered, they may still have sand on them. Clean the weapon frequently so it will be ready when needed.
- PMCS in the desert is absolutely essential. Left unattended, sand and wind will rapidly destroy the most basic piece of soldier gear.
- Sand clogs fuel lines and wears out tires and other rubber and plastic parts faster. It also seeps into engines and cooling systems. This results in overheated engines that can cause sudden and catastrophic failure.
- Food service organizations require intense supervision. Current menus must be augmented with fresh fruit, vegetables, and breads to provide soldiers the roughage and nutrients they need.

COMMAND AND CONTROL

- Desert evenings can be extremely long or short. Leaders should be concerned with EENT, BMNT, and percentage of illumination. These factors will be extremely important when conducting night operations.
- Dry desert conditions can, at times, reduce radio signal strength and create unforeseen blind spots, even in aircraft operating nap of the earth.
- FM communications may be degraded due to dead spots caused by heavy concentrations of minerals close to the surface. Establish firm procedures for constant control, either by radio or through liaison.
- Ensure that all know the commander's intent and rehearse battle drill so that actions are understood even in the absence of orders.

SECTION II: COUNTERMINE OPERATIONS

A. Background. Although GIs in World War II and Korea experienced their share of mine incidents, U.S. forces in Vietnam routinely faced the threat posed by mines and ambushes along their LOCs. Soldiers learned through trial and error to operate in this difficult environment. The experience produced many useful lessons learned. Commanders can take steps to significantly reduce mine losses. Appropriate tactics, combined with an aggressive training program for all personnel in mine warfare, proves to be an effective means of reducing casualties and equipment losses. To understand the threat, it is necessary to understand the enemy. His characteristics may include the following:

- He is as smart as you and extremely imaginative.
- He is part of the environment and culture.
- He is motivated to kill you.
- He is politically aware and will exploit the U.S. news media.
- He will wait until you have become complacent.

B. Countermine Tactics and Techniques

"The easy way is always mined." Murphy's Laws of Combat

1. The Environment

Mines are cheap, easy to manufacture and deploy, and provide an effective countermeasure to a modern force. Countering mines increases the logistics burden on a force – from the necessity to carry additional equipment and clearing personnel to the need for additional medical and mortuary services. Mines that wound rather than kill are more efficacious since every wounded soldier ties up many support and medical personnel. Mines also rob a track or wheeled force of its high-speed mobility and reduce the rate of movement to the speed of a cautious sapper. For these reasons, the problem of countering mines will remain a constant for units in Afghanistan.

Observations from 30 Dec 96 landmine incident:
• Although the blast from the landmine effectively destroyed the HMMWV, soldier injuries were mitigated because they were all wearing their Kevlar vests and helmets with chinstraps fastened.
• The soldiers reported being thrown violently inside the vehicle, with heads banging on the dashboard and the frame of the vehicle.
• The force of the blast bruised their upper torsos.
• Doctors assessed that their Kevlar vests and helmets were the primary reason the soldiers weren't much more seriously injured.
• After the incident, the soldiers credited their mine awareness training with enabling them to react properly and exit the minefield without further injury.

In Afghanistan, the Russians buried and dropped about 10 to 12 million mines (some estimates are as high as 15 million) in the ground. "Minefields laid by the Soviets and the previous Afghan government forces were generally recorded and catalogued according to military procedures," reported the UN Office for the Coordination of Humanitarian Affairs (UNOCHA) in 1994. "However, the vast majority of mines laid by the mujahideen were not recorded or laid to any specific pattern. Moreover, the records lost much of their significance as the many areas were fought over, and won and lost by both sides during the war." All mine-clearing activity in Afghanistan has been suspended since 12 September 2001according to the U.N. Mine Action Program.

2. Types of Landmines

The following is a listing and brief description of the types of landmines likely to be encountered in your operational area.

- **Blast Warheads.** Blast warheads are simple to manufacture. They use simple fuzes, such as pressure triggers and tripwires. Presently, there is a large stockpile of these types of mines worldwide, and they have been and will be used in all levels of conflict.
- **Shaped Charges**. These are also referred to as "hollow mines." They are simple to manufacture, have a variety of fuzes (including magnetic), and can penetrate armor in a range of 60 mm to 250 mm. Typical armor penetration is 90 mm.
- **Scatterable**. A key characteristic of these landmines is rapid emplacement. They have a variety of fuzes, mostly non-contact. These can be deployed via helicopter, fixed-wing aircraft, artillery, and ground-vehicle dispensers. They permit efficient minefield emplacement, but do not allow adequate documentation of mine location.
- **Side-Attack**. This mine is placed by the side of a road or track where a vehicle may pass. It will fire a shaped-charge into the target's side. It can penetrate armor up to 150 mm. It is also known as a horizontal action mine or off-route mine.
- **Top-Attack**. These mines are directed specifically at the top of a tank (turret) where the armor is weakest. Top-attack mines can also be used against personnel. These can be air-delivered or hand-emplaced. The hand-emplaced version uses acoustic sensors to recognize the approach of an armored vehicle and then activates an IR homing sensor. The munition detonates above the target and sends a shaped-charge downward.
- **Anti-Personnel**. A mine designed to injure or kill personnel. These are activated by several means, the most common being activation by pressure, pull, or command detonation. The necessary pressure or pull can be as little as 2.2 pounds (1 kg).
- **Anti-Air Mines**. The most common types in this category are anti-helicopter mines, due to the relatively slow speeds and hovering ability of rotary-wing aircraft. The anti-helicopter mine can detect an aircraft up to a distance of 3.7 miles (6 km). The mine can use an IFF (identification friend or foe) system to decide whether to attack the aircraft.
- **Anti-Tank**. A mine designed to disable or destroy vehicles and/or tanks. The explosive can be activated by many types of fuze mechanisms, the most common being pressure, tilt-rod, influence, or command detonation.

3. Mine Activation Methods

- **Trip-Wire (pull)**. A wire attached to one or more mines to increase the activation area. Pressure on or breaking of the tripwire will activate the mine fuze. A tripwire is normally attached to a bounding or fragmentation-type mine. Often employed in a nuisance minefield, it is also used in the forward rows of anti-tank, anti-personnel, and mixed minefields.

- **Pressure**. Some of the more common and older mines use pressure-sensitive plates or hammers to initiate the explosive. Pressure fuses are used for both anti-personnel and anti-tank mines.
- **Acoustic**. Utilizes microphones to detect the approach of a vehicle. Usually the primary sensor will "awake" a secondary IR or laser sensor.
- **Infrared Sensors**. Once activated, the IR sensor detects and tracks the target until engagement is complete.
- **Tilt-rod.** With this type, there is a post or pole normally attached to a fuze mechanism on the top of a mine. Pressure against the tilt rod activates the charge by breaking or releasing a mechanical retaining device, thereby initiating the detonation chain.
- **Influence/Proximity**. Activation of the mine is caused by the magnetic influence of a vehicle's mass. Employed primarily against vehicles and ships. These mines include infrared, magnetic, acoustic, and seismic.
- **Command-Detonated**. This has the ability to be detonated remotely.
- **Double Impulse**. This is usually an anti-tank mine that requires two separate pressures on the fuze to set off the detonation chain.
- **Chemical-Friction Fuze**. This has a fuze in which substances are separated until required for action. After they are brought into contact and unite chemically, an explosion is produced.

4. Route Clearance Techniques

Although GIs in World War II and Korea experienced their share of mine incidents, U.S. forces in Vietnam routinely faced the threat posed by mines and ambushes along their LOCs. Soldiers learned through trial and error to operate in this difficult environment. The experience produced many useful lessons learned. Commanders can take steps to significantly reduce mine losses. Appropriate tactics, combined with an aggressive training program for all personnel in mine warfare, has proven to be an effective means of reducing casualties and equipment losses. Vietnam and Somalia demonstrated that route clearance must be treated as a combined arms combat operation to ensure success. Three proven techniques are available to clear a route: deliberate sweep, hasty sweep, and mine reconnaissance.

- **The Deliberate Route Clearance.** The techniques described here for the deliberate sweep represent an "ideal" case and must be adapted to available resources and conditions. If the situation permits, the sweep should be conducted when a road is initially opened for traffic and, if possible, every morning thereafter. An infantry company team, with an attached tank platoon (with mine rollers) and a reinforced engineer platoon, and supported by preplanned artillery and gunship helicopters, is normally required for a deliberate route clearance. A reserve should be held at battalion level, ready for immediate commitment. The company team performing a deliberate route sweep should advance astride the main supply route (MSR) in an inverted "v" formation. Dismounted infantry platoons, each with an attached combat engineer team, move along the flanks while carefully searching for wires and other signs of command-

detonated mines or ambushes. The two platoons should be far enough ahead of the sweep team on the road to investigate suitable sites for an individual to observe the sweep team and activate a command-detonated mine. If the platoon is near a tree line, a security team should sweep the tree line ahead of it. The effectiveness of this flank security as a countermeasure to command-detonated mines can be significantly increased by following each platoon with an up-armored bulldozer fitted with a single tooth ripper.

- **The Hasty Route Clearance**. As an alternative, a hasty sweep can be conducted daily prior to the beginning of convoy operations when it is urgent that traffic use the road. In a hasty sweep, the mine detector operators walk at a normal pace sweeping back and forth. Suspicious areas should be thoroughly checked. A mine reconnaissance can be used in place of a hasty sweep in some situations. Prior to opening the MSR to daily traffic, a small engineer team may drive over the route looking for any visual evidence of mining activity on the road. A dismounted team should thoroughly sweep any suspicious areas.
- **Mine Reconnaissance.** The mine reconnaissances performed in Somalia (in January 1993) were augmented with commercial infrared cameras. Infrared cameras proved very effective at finding buried mines on roads during certain times of the day from a standoff of approximately 100 feet. However, performance may be degraded by weather conditions and vegetation. The need for hasty sweep and mine reconnaissance procedures are used because the "100-percent solution" is not always feasible, and some reasonable amount of risk must be accepted. The commander must determine the proper balance between risk and requirements.

5. Mine Detection Techniques

Although it will not be possible to eliminate all casualties or equipment damage due to mines, there are steps that can be taken by commanders to reduce these incidents to a minimum. Appropriate tactics, combined with an aggressive training program for all personnel in mine warfare, is an effective means of reducing casualties and equipment losses.

- Observe people along the MSR. When a normally crowded area is abandoned, increased alertness is appropriate. Children, when rewarded, may provide constant observation between spaced outposts, as well as show friendly personnel where the militia has placed mines. Occasionally, the area immediately over the mine is swept with a brush, therefore breaking the continuity of wheel tracks left in the dirt. Roadblocks are also frequently mined and/or booby-trapped.

Lessons Learned Information Paper #13 (8 Feb 96)
Booby Trap Awareness, 31 Jan 96, 3-325 ABCT
During a patrol of the zone of separation on 31 Jan 96, E Co, 3-325 ABCT encountered an unoccupied building. Before entering through the door of the building, the patrol carefully examined the building interior through a side window. The patrol was able to detect a wire leading from the interior door knob to what appeared to be hand grenades hanging over the door entrance. The patrol did not enter the building and reported the booby trap to the TOC. Upon later examination by EOD elements, it was determined that the apparent grenades were, in fact, only grenade fuses. The patrol demonstrated excellent booby trap awareness in their actions before entering the building: exercise caution, let EOD handle booby trap problems.

- Mine detection dogs may be employed in some situations to supplement route-sweeping teams. If employed, the handler and the dog must be viewed as an indivisible element. The dogs are capable of working 3 to 4 hours in moderate climatic conditions, and will require special veterinary support to retain their effectiveness. In order to conduct sustained operations, multiple teams will be required. Their handlers will be able to provide other employment recommendations.
- Do not take for granted that a road is cleared when it passes through a friendly village or outpost.
- If a mine is detonated, security must be established simultaneously with the care of the wounded.

6. Countermine Techniques and Protection

Operational Vignette: A unit was making drawings of areas along the IEBL. Upon task completion, the convoy was oriented westward on Route Fanta, an improved road surface. To return to their base camp, the convoy had to turn around. They located an unimproved road that they could back into and turn around. As each vehicle turned around, it was forced to pass the vehicle following it on the improved surface road. The lead vehicle had little trouble passing the other three vehicles in the convoy. The second vehicle passed the third vehicle without any problems. However, as it was passing the trail vehicle in the convoy, it struck an anti-tank mine with the front tire of the vehicle. Engineers assessed that the FWF may have buried a mine under the improved surface road and the weight of the vehicle had caused the asphalt to sink, detonating the mine. The mine destroyed the entire front of the HMMWV. Soldiers in three of the HMMWVs sustained injuries.

- Cap all road repairs with quick setting concrete or asphalt to prevent the laying of mines in the loose gravel that is often used to fill potholes. This technique was used effectively in Vietnam.
- Use 2-1/2 ton and 5-ton vehicles to lead convoys, with a manned HMMWV in the second or "slack" position. These type vehicles are significantly safer in the event of a mine blast than are light-wheeled vehicles, such as the HMMWV.
- If possible, vehicles should have two cables to expedite recovery in case of a mine strike – one on the front and one on the rear. The rear cables should be attached to the lower mounts. This technique allows crews to hook up to a disabled vehicle without touching the ground.
- Increase crew survivability through enhancements, such as sandbagging vehicles, wearing seat belts, and placing 25 gallons of water in each tire to mitigate blast damage. Keep speed below 25 mph; after a mine detonation, there will be a vehicular accident.
- The use of the KEVLAR blanket has proven to be a tremendous anti-mine reactive countermeasure. It minimizes the explosion's impact and reduces flying debris.

- Establish a mine information center that would be responsible for collecting, analyzing, and disseminating information on the mine threat.
- Mark the MSR with asphalt products that make any digging immediately obvious. This technique was employed effectively in Vietnam using Peneprime.
- Consider offering money in coordination with a PSYOP campaign for information on the location of mines and for weapons and ordnance turned in by the local population.
- During planning, consider both mining and ambush by insurgents.
- Roads previously cleared should not be considered secure unless constant surveillance has been maintained.
- Secure all loose articles; they can become high-speed projectiles in the event of a mine detonation.
- Place two layers of sandbags on the floor of the vehicle cab and bed. Cover the sandbags with heavy conveyor belts or rubber matting to reduce secondary fragments.
- Do not put rocks in a sandbag; they may become secondary missiles in the event of a detonation.
- Non-ballistic windshields should be sandbagged down. Place sandbags on the hood above the dash to cut down on flying metal or glass.
- Strive for uniformity of appearance between vehicles. Cross-load key personnel and equipment.
- Follow tracks of the vehicle ahead, but avoid old tracks since they could be mined.
- Have hatches open on armored vehicles to vent pressure pulse.
- Rehearse unit-developed battle drills for actions in the event of a mine detonation or enemy ambush.
- Disperse after a mine incident, establish security, and clear the area with a sweep team. Do not cluster around; establish security.
- Many units establish a procedure for mine sweeps and then never deviate from it. This action has the advantage of assuring the commander of a thorough, well-controlled sweep. However, it also gives the enemy the advantage of being able to predict movements. He is then able to place his mines to inflict maximum damage.
- Do not take for granted that a road is cleared when it passes through a friendly outpost.
- A careless attitude breeds poor security. The militia will observe this and strike a unit when its guard is down. Likely ambush places must be physically checked. Dispersion and good firing positions must be taken up during halts.

7. Reporting

A spot report to the intelligence officer (S2) should be made immediately upon discovery or detonation of any mine. It is important that the spot report contain an accurate location (coordinates) of the incident. A written report containing all facts and commander's comments should be forwarded to the operations officer (S3) within 24 hours of the incident. If possible, sketches of the site showing where the mine was or a view of the buried mine should be included. Any recovered intelligence materials should be sent to the S2 in 24 hours.

Lessons Learned Information Paper #17 (20 Feb 96)
Booby Traps, 17 Feb 96
On 17 Feb 96, a local civilian approached a C/3-4 CAV checkpoint and complained that an unoccupied, partially destroyed house had been booby trapped. C/3-4 CAV sent a patrol to investigate, and verified that there was one SPK M79 grenade rigged to the door of the house. The patrol did not attempt to clear the booby trap. They marked the house and the adjacent street with mine warning signs and reported the situation to their higher headquarters. The Former Warring Factions are required to remove mines and booby traps, not TFOR soldiers. C-3/4 CAV handled this situation correctly: They investigated the report of the booby trap; they reported what they found to their higher headquarters, Former Warring Factions, and the appropriate civilian authorities to warn displaced persons; they did not attempt to clear the booby trap themselves; and they marked the area to warn others.

8. Neutralization

When a mine or firing wires are detected, move all personnel except one man at least 100 meters from the area. He should immediately search for lead wires (all ordnance, including pressure fuzed AT mines can be rigged for command detonation). If found, they should be cut one at a time and shunted. One man attaches firing wire to wires leading into the road, being careful not to disturb the wire or pull it, then moves to a safe position and tries to fire the mine electrically. Remember that AP (antipersonnel) mines may be placed along the firing wire to protect it. If the mine does not detonate or demolition in place is unacceptable, sweep along the wire (one man) toward the road until the mine is located, and remove the mine from the MSR using an A-frame and grapnel. If unable to locate the mine, set a row of charges on the road and blow them all. After the mine has been detonated, carefully attach a piece of wire or rope to the end of the wires leading away from the road. If an armored vehicle is available, play out the wire or rope attached to the firing wires and pull by hand at a safe distance. Do not pull directly on the wires or probe around the wires. This same procedure may be used for wires leading to the road. If unable to pull the wire out completely, get an armored vehicle to run down the wire to its end.

Common practice is to “blow in place” any enemy mine that has been detected. This will result in a large crater that must be backfilled and capped. Whenever possible, attempt to extract mines located on an MSR. Use approximately 150' WD-1 wire or parachute cord and an A-frame. Look out for stacked mines and anti-handling devices/booby traps. This removal can be accomplished off to the side of the road with little danger for destruction. After removing a mine from a hole, recheck it for other mines using mine detectors and probes. If multiple mines

are to be removed from an area, they should be moved to a single point for demolition; this will save both time and demolition. Removing mines in this manner allows the road to be reopened immediately; eliminates the necessity of repairing a crater; and denies the enemy an excellent location for a mine – a recently repaired road crater. After neutralizing the mine, the hole should be checked again by a mine detector and a prober in case the enemy placed more than one mine in the hole. Also, a vigorous campaign should be conducted to inform users of the road not to leave metallic trash on the MSR.

Always assign a team to the same section of road, as it has been found that efficiency increases as team members become familiar with the condition of the surface and areas of repeated incidents on their part of the road.

Increase the size of the basic sweep team to include four primary detectors which sweep the width of the road. If a positive reading is obtained, the location is marked and the probers start searching the area with the assistance of two backup detectors. By using these additional mine detectors, the primary detectors can remain together and continue sweeping, ensuring complete and continuous coverage of the road.

Sweep with multiple teams, one starting at each end, and pairs of teams diverging from intermediate start points along the MSR and working toward each other. The teams can be inserted by helicopter.

9. Mine Countermeasure SOP Items

The following TTPs maximize force protection and are essential to reducing soldier risk:

- Block off unnecessary routes.
- Limit to only daylight operations in areas of uncertainty.
- Treat cleared areas as suspect. A minefield is always a minefield ... even when cleared.
- Ensure every vehicle has a map with minefields marked.
- Post lessons learned in high traffic areas. Discuss and review at platoon level.
- Ensure new soldiers are briefed and oriented on unit sector.
- Weather changes requires re-proofing of lanes.
- Always wear kevlar and body armor.
- Ensure all radios have MEDEVAC frequencies pre-set on position 6 of SINCGARS.
- All unoccupied buildings, equipment, etc., will be treated as mined until cleared.
- Ensure every vehicle has engineer tape and mine marking material.
- Conduct monthly mine awareness refresher training.
- Incorporate lessons learned with daily risk assessment.
- Review current engineer mine database prior to all mounted and dismounted.
- Ensure commanders check engineer mine overlays for updates.

- Pair up new soldiers with experienced soldiers.
- Avoid road shoulders.
- Never touch a mine. Don't give in to curiosity.

10. Patrolling

Patrolling is a requirement throughout the AOR. Units plan, coordinate, rehearse, and certify patrols to ensure the force protection of soldiers. The following TTPs are for all patrols:

- Review current engineer mine database prior to all patrols.
- Commander must check engineer mine overlay for latest updates.

Dismounted Patrols

Dismounted patrolling offers the least protection to soldiers, but is necessary in several areas due to restrictive terrain. Commanders can make use of the following techniques to reduce risk and increase force protection for dismounted patrols:

- Move only on previously cleared routes.
- Faction guide in front.
- Point man 15 meters behind faction guide.
- Interpreter in front part of formation to communicate with guide and locals
- Point man follows tracks of guide.
- Second soldier (slack man) scans ahead, pulling security.
- Ask local populace about mines.
- When in doubt, stop and retrace steps.
- Use faction guides for trails not frequently traveled.
- Squad moves slowly and deliberately, focuses on ground, and looks for turnaround points, conducting frequent halts. Stop and return if a mine is found.
- Mark mine.

Mounted Patrols

- Mounted patrolling is the preferred method when METT-T allows.
- Guides are invaluable in negotiating local road networks.
- Factions proof lanes first, even if only with a heavy civilian truck.
- Re-proof roads after a thaw. Frozen ground inhibits effective mine removal/lane proofing.
- After proofing, the lead vehicle carries no soldiers in troop compartment.
- Drivers wear both lap and shoulder belts.
- All hatches are open to reduce blast injury in event of mine strike.
- 50-100 meters between vehicles.
- Medic with aid bag on every patrol.

11. Extracting a Vehicle from a Minefield

Extracting a vehicle from a minefield is conducted the same whether a mine strike has occurred or not. All movement should cease upon discovery that the vehicle may be in a minefield. It is important to note that casualties complicate these procedures, but do not supersede them. Use these techniques to prevent more casualties (vehicular and personnel) in the event of a mine strike:

- Stay in vehicle.
- Call for help.
- Exit vehicle from the top and climb down the rear.
- Step into vehicle tracks.
- Follow tracks out, looking for tripwires.
- Once clear:
  - Mark.
  - Record on map.
  - Report to unit.
- Vehicle recovery from minefield:
  - Engineers clear lane to, use all available tow cables to increase distance before towing.
  - Mounted tow shackles is a PCI check.
  - Make sure all shackle sets are complete.
  - If possible, vehicle should have tow cables on front and rear. Rear cables should be attached to lower mounts (allows crew to recover without touching ground).
  - Pull vehicle out at least two vehicle lengths before switching to towbar.
  - When M88 vehicle is available, use tow cable to maximum distance possible.
  - When towing vehicle after mine strike, chance of fire is greater due to possible damage to vehicle.

12. Breaching Operations Under Fire

The first technique for encountering a minefield is to try to find a bypass. Breaching minefields under fire is one of the most complex and challenging tasks in combat. The casualties and time delays incurred breaching threat minefields will severely degrade decisive offensive action.

Breaching is a combined arms operation which is an integral component of any attack. Breaching an obstacle under effective fire is not normally possible because 30-60 minutes of manual breaching in these conditions normally results in catastrophic casualties. If hasty breaching is to be successful, the task force must reduce the obstacle in 7-10 minutes.

13. Security During Mine Clearance

A unit was conducting minefield clearance with one of the factions. The mines were stockpiled, and EOD emplaced explosives to destroy the mines. All personnel moved to a safe location, and EOD ignited the fuse, a common event that occurs everyday in the ZOS until . . . a soldier saw a farmer walking down a trail toward the field. The farmer had been working the same fields for years and knew where the mines were, so he went about his business as usual. The soldiers alerted the farmer and he moved to safety. However, an older man, unseen by the soldiers, was behind the farmer and continued moving along the trail. The demolitions exploded, and the second man was knocked to the ground, unhurt, but obviously startled. The second man was not seriously injured; however, the entire incident might have been avoided.

- Once it is determined when and where the mine demolition will take place, use your translators or CA personnel to notify the populace that mine clearance is being conducted and to stay out of the area. Tell them how long it will take so they will know when they can go back to work.
- Prior to the conduct of a clearance mission, conduct a reconnaissance to determine routes into the area, particularly those farmers would use.
- Consider putting bullhorns on your equipment list for mine clearance operations. The bullhorns (or air horns) can help alert civilians who accidentally wander into the area. If available, use a TPT loudspeaker team to explain the signals to the local populace.
- Clearly mark all routes leading into the area with signs notifying the populace that mine clearing operations are being conducted.

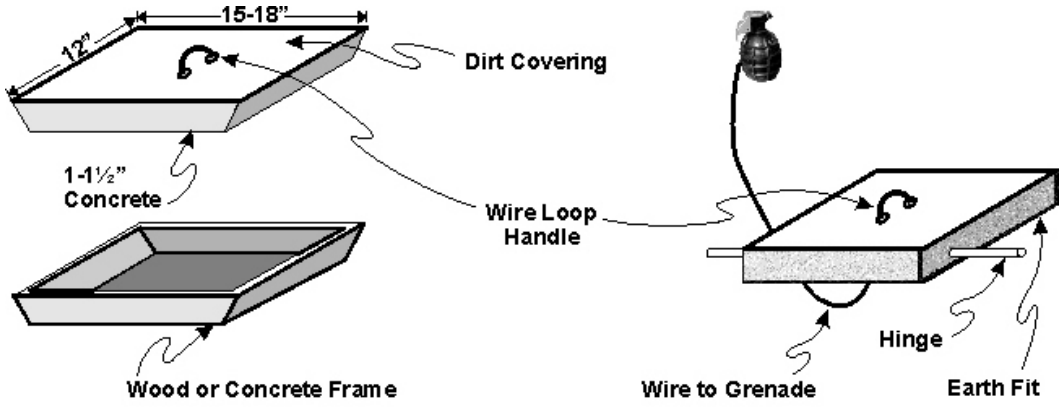
SECTION III: OPERATIONS AGAINST TUNNELS AND CAVE COMPLEXES

The use of tunnels as hiding places, caches for food and weapons, headquarters complexes, and protection against air strikes and artillery fire has been characteristic of the nature of the war in Afghanistan and other desert environments. An extensive tunnel system containing conference, storage, and hiding rooms, as well as interconnected fighting points, has been frequently encountered. These complexes present a formidable and dangerous obstacle to current operations, which must be dealt with in a systematic, careful, and professional manner. Additionally, they are an outstanding source of intelligence, as evidenced by the documents found during the clearing of tunnels during recent operations.

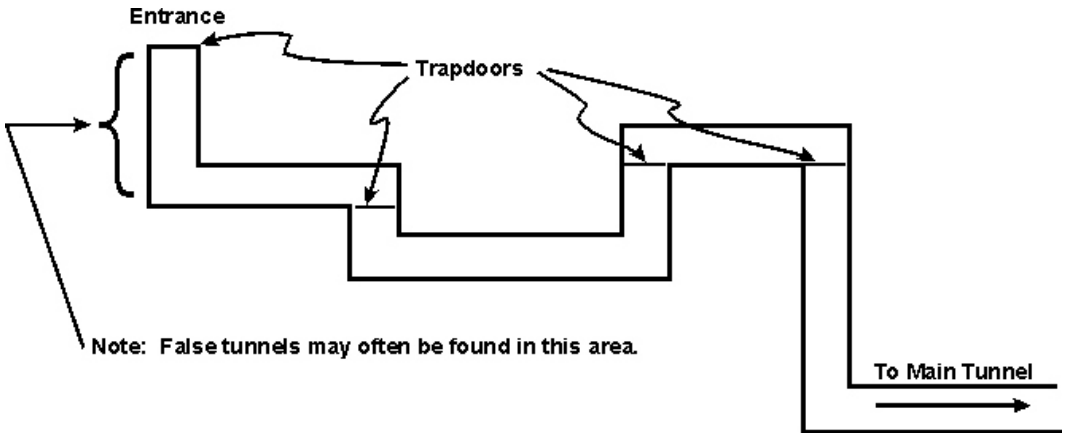
A. Tunnel Characteristics

The first characteristic of a tunnel complex is normally superb camouflage. Entrances and exits are concealed, bunkers are camouflaged, and even within the tunnel complex itself, side tunnels are concealed, hidden trapdoors are prevalent, and dead-end tunnels are used to confuse the attacker. In many instances, the first indication of a tunnel complex will be fire received from a concealed bunker, which might otherwise have gone undetected. Spoil from the tunnel system is normally distributed over a wide area.

Trapdoors may be used, both at entrances and exits and inside the tunnel complex itself, concealing side tunnels and intermediate sections of a main tunnel. In many cases, a trapdoor will lead to a short change of direction or change of level tunnel, followed by a second trapdoor, a second change of direction, and a third trapdoor opening again into the main tunnel. Trapdoors are of several types: They may be concrete covered by dirt, hard packed dirt reinforced by wire, or a "basin" type consisting of a frame filled with dirt. This latter type is particularly difficult to locate in that probing will not reveal the presence of the trapdoor unless the outer frame is struck by the probe. Trapdoors covering entrances/exits are generally a minimum of 100 meters apart. Booby traps may be used extensively, both inside and outside entrance/exit trapdoors. Typical trapdoor configurations found in Vietnam are shown in the sketches below and on the following page.



The following typical elevation view of a tunnel entrance section illustrates use of trapdoors. Air shafts are spaced at intervals throughout the system.



Recognition of their cellular nature is important for understanding tunnel complexes. Prisoner interrogation has indicated that many tunnel complexes are interconnected, but the connecting tunnels, concealed by trapdoors or blocked by three to four feet of dirt, are known only to selected persons and are used only in emergencies. Indications also point to interconnections of some length, e.g., 5-7 km, through which relatively large bodies of men may be transferred from one area to another, especially from one "fighting" complex to another. The "fighting" complexes terminate in well-constructed bunkers, in many cases covering likely landing zones in a war zone or base area.

B. Tunnel Techniques

- A trained tunnel exploitation and denial team is essential to the expeditious and thorough exploitation and denial of enemy tunnels. Untrained personnel may miss hidden tunnel entrances and caches, take unnecessary casualties from concealed mines and booby traps, and may not adequately deny the tunnel to future enemy use.
- Each unit should designate tunnel teams. Tunnel teams should be trained, equipped, and maintained in a ready status to provide immediate expert assistance when tunnels are discovered.
- Careful mapping of a tunnel complex may reveal other hidden entrances as well as the location of adjacent tunnel complexes and underground defensive systems.
- Small caliber pistols or pistols with silencers are the weapons of choice in tunnels, since large caliber weapons without silencers may collapse sections of the tunnel when fired and/or damage eardrums.

- Personnel exploring large tunnel complexes should carry a colored smoke grenade to mark the location of additional entrances as they are found. In mountainous desert areas it is often difficult to locate the position of these entrances without smoke.
- Two- and three-man teams should enter tunnels for mutual support.
- Claustrophobia and panic could well cause the failure of the team's mission or the death of its members.
- Constant communication between the tunnel and the surface is essential to facilitate tunnel mapping and exploitation.

C. A representative equipment list for a tunnel team is shown below:

Protective Mask - one per individual
TA-1 telephone - two each
One-half mile field wire on doughnut roll
Compass - two each
Sealed beam 12-volt flashlight - two each
Small caliber pistol - two each
Probing rods - 12 inches and 36 inches
Bayonet - two each
Mity Mite Portable Blower - one each
M7A2 CS grenades - twelve each
Powdered CS-1 - as required
Colored smoke grenades - four each
Insect repellant and spray - four cans
Entrenching tool - two each
Cargo packs on pack board - three each

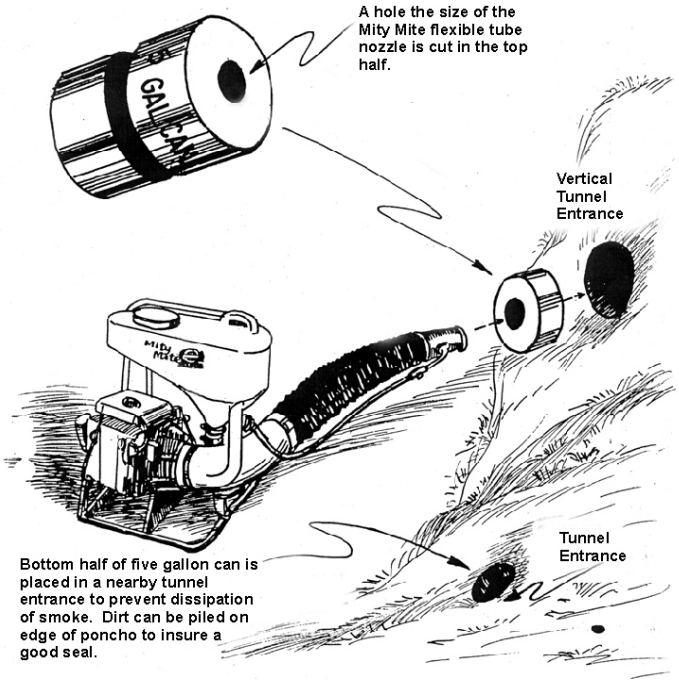
D. Tunnel Exploitation and Destruction

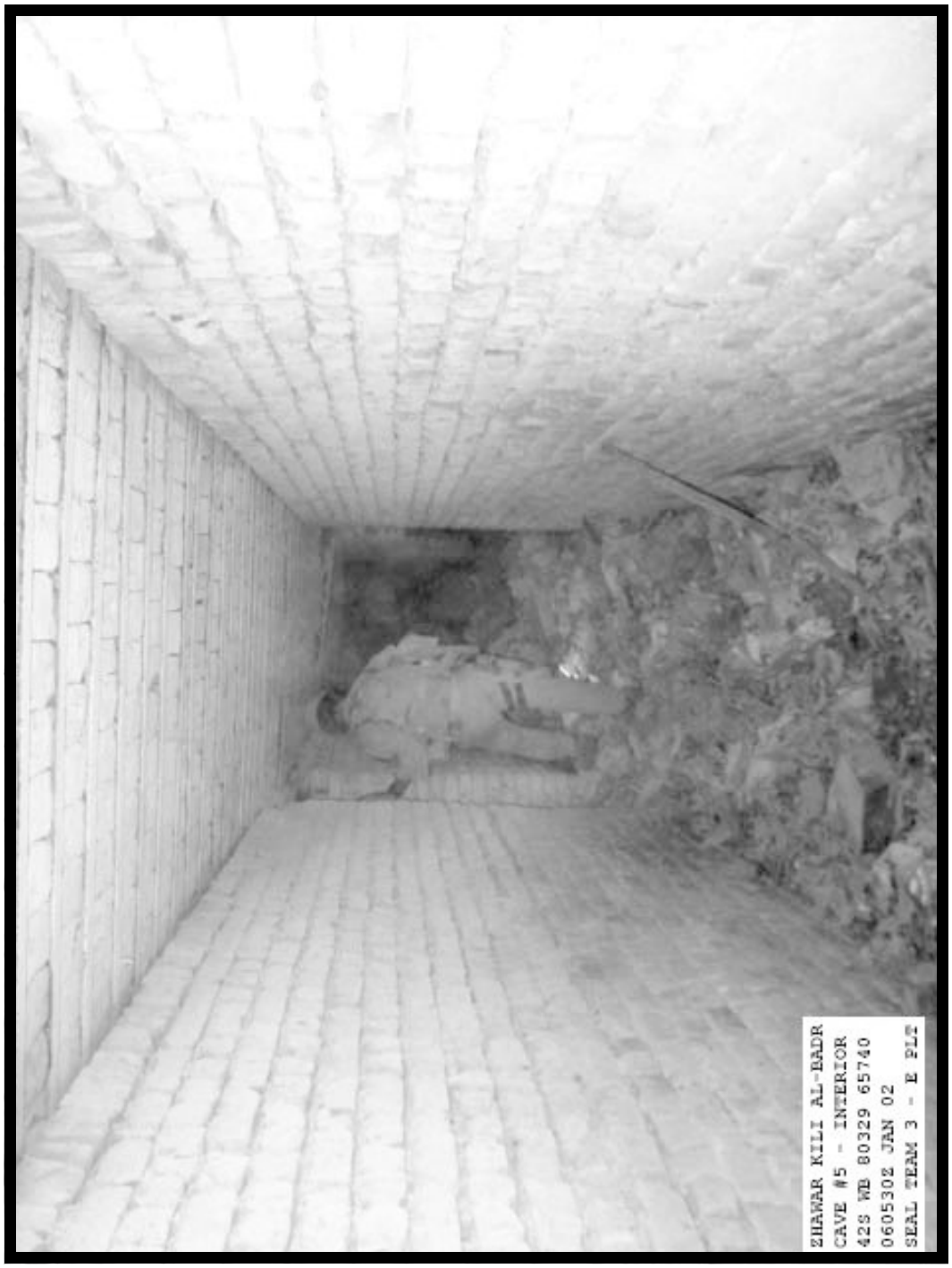
- The area in the immediate vicinity of the tunnels is secured and defended by a 360-degree perimeter to protect the tunnel team.
- The entrance to the tunnel is carefully examined for mines and booby traps.
- Two members of the team enter the tunnel with wire communications to the surface.
- The team works its way through the tunnel, probing with bayonets for booby traps and mines and looking for hidden entrances, food and arms caches, water locks, and air vents. As the team moves through the tunnel, compass headings and distances traversed are called to the surface. A team member at the surface maps the tunnel as exploitation progresses.
- Captured arms and intelligence documents are secured and retrieved for destruction or analysis.
- Upon completion of exploitation, cratering charges or other available explosives are placed at all known tunnel entrances to seal each and prevent reuse by the enemy. If time or materials are not available for immediate closure, CS-1 Riot Control Agent can be placed at intervals down the tunnel at sharp turns and intersections. It must be emphasized, however, that the denial achieved by the use of CS-1 is only temporary in duration and used until demolitions are available to completely destroy the complex.
- Tunnels are frequently outstanding sources of intelligence and should, therefore, be exploited to the maximum extent practicable.

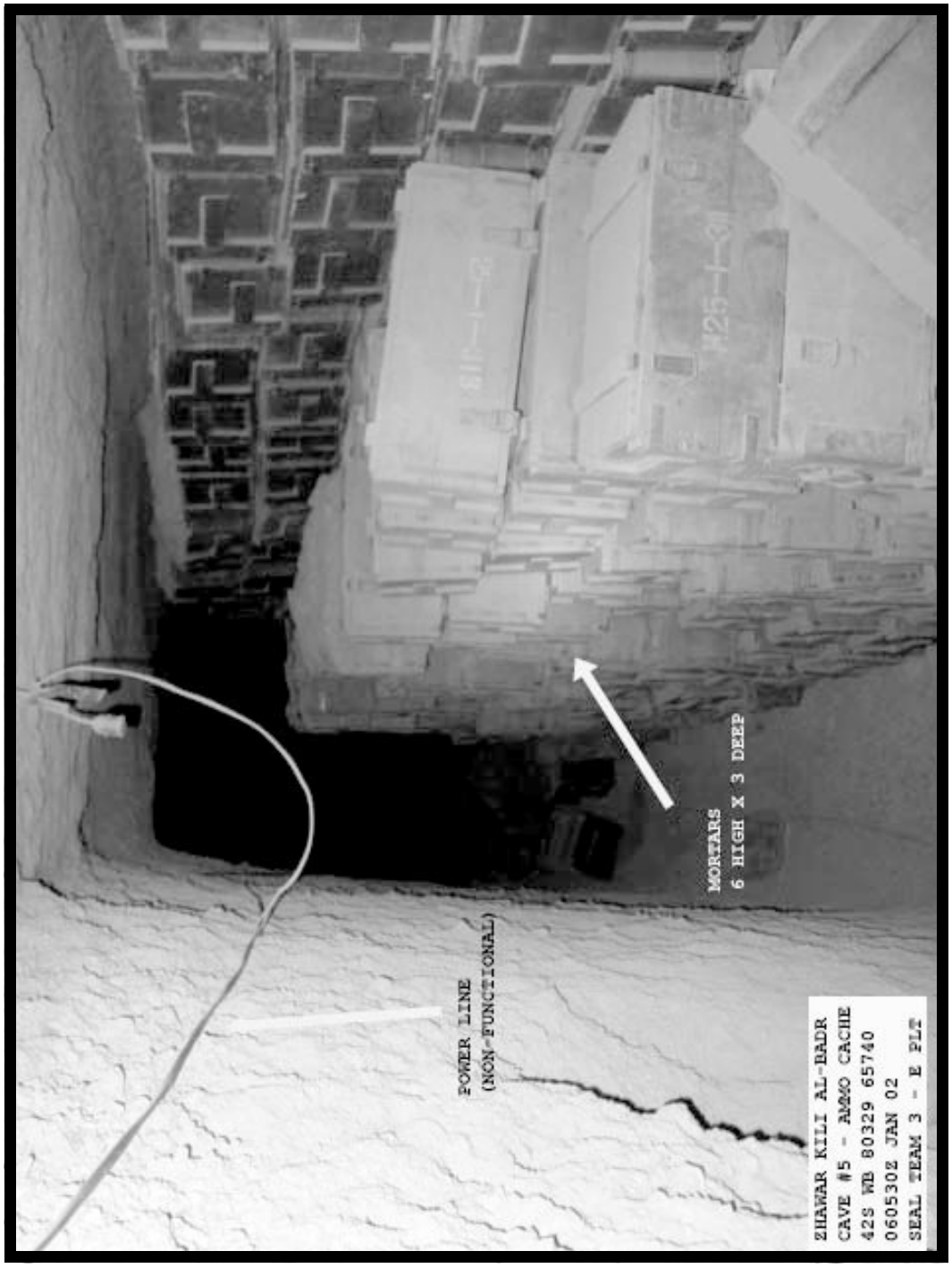
- Since tunnel complexes are carefully concealed and camouflaged, search and destroy operations must provide adequate time for a thorough search of the area to locate all tunnels. Complete exploitation and destruction of tunnel complexes is very time consuming, and operational plans must be made accordingly to ensure success.
- The presence of a tunnel complex within or near an area of operations poses a continuing threat to all personnel in the area. No area containing tunnel complexes should ever be considered completely cleared.
- Current chemical denial methods are only temporarily effective against tunnel complexes. Test results to date indicate that CS-1 effects should last about seven days.

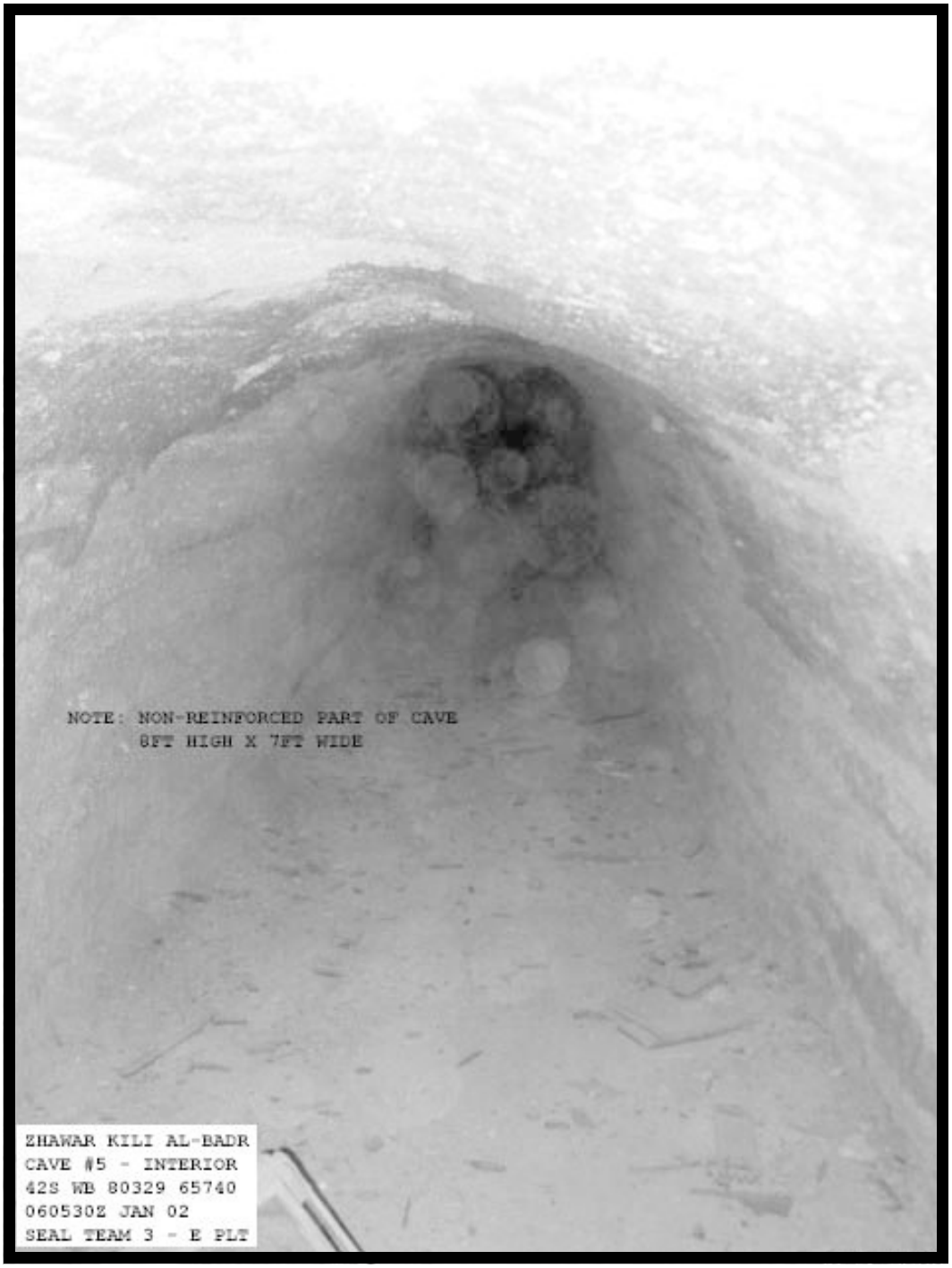
E. Tunnel Flushing and Denial

- In some areas the combat situation will permit a hasty search for hidden tunnel entrances, but either lack of time or enemy occupation of the tunnel will not permit searches by a tunnel team.
- In this case the Mity Mite Portable Blower (RVN, MACV 1965) can be employed to flush the enemy from the tunnels using burning type CS Riot Control Agent grenades (M7A2). In addition, the smoke from the grenades will, in most cases, assist in locating hidden entrances and air vents.
- After flushing with CS grenades, powdered CS-1 can be blown into tunnel entrances with the Mity Mite to deny the tunnel to the enemy for limited periods of time. It must be remembered, however, that this method will only be effective up to the first "firewall."




ZHAWAR KILI AL-BADR
CAVE #5 - INTERIOR
42S WB 80329 65740
0605302 JAN 02
SEAL TEAM 3 - E PLT


ZHAWAR KILI AL-BADR
CAVE #5 - AMMO CACHE
42S WB 80329 65740
060530Z JAN 02
SEAL TEAM 3 - E PLT
POWER LINE
(NON-FUNCTIONAL)
MORTARS
6 HIGH X 3 DEEP


NOTE: NON-REINFORCED PART OF CAVE
8FT HIGH X 7FT WIDE
ZHAWAR KILI AL-BADR
CAVE #5 - INTERIOR
42S WB 80329 65740
0605302 JAN 02
SEAL TEAM 3 - E PLT

F. Dangers

Dangers inherent in tunnel operations fall generally into the following categories and should be taken into account by all personnel connected with these operations:

- Presence of mines and booby traps in the entrance/exit area.
- Presence of small but dangerous concentrations of carbon monoxide produced by burning-type smoke grenades after tunnels are smoked. Protective masks will prevent inhalation of smoke particles, which are dangerous only in very high concentration, but will not protect against carbon monoxide.
- Possible shortage of oxygen as in any confined or poorly ventilated space.
- Enemy still in the tunnel who pose a danger to friendly personnel both above and below ground (in some instances, dogs can successfully detect enemy hiding in tunnels).

SECTION IV: LEADER TIPS

A. Morale Factors

In recent contingency operations, several soldier support issues have repeatedly been shown to be important factors that should be addressed during planning. It has been found that soldier morale is related to several key issues. These eight issues rate consideration when planning for a contingency operation (no particular priority or hierarchy is intended).

- **MAIL:** Troops need ongoing confirmation that all is well back home. Mail (including Internet mail) is more important than packages from home, although all mail is eagerly anticipated. The command should see to it that mail delivery is begun as soon as practical, both outgoing as well as incoming. Mail must be managed closely because it becomes another class of supply and a significant logistical challenge when many personal packages are sent to the theater.
- **MESS:** Troops tolerate cold rations for a while, a little longer in combat than in noncombat operations. If they can see no reason for the delay of hot meals, fresh fruits, vegetables, juices, and cereals with fresh milk, they expect them to be forthcoming.
- **PAY:** Troops need to know their pay is going to the right place, on time. They also need a small amount of money in theater for PX items when AAFES establishes operations. The pay policy should be established during planning and announced to the troops so they can plan accordingly.
- **INFORMATION:** Soldiers want to know what is going on in their unit, in neighboring units, and in the theater. They also want to know about world events and how their favorite sports teams are doing back home. Troops want to know that they can get home on emergency leave, if it becomes necessary.
- **MEDICAL SUPPORT:** Soldiers need to know that quality medical support is immediately available to them. Observations indicate that medical support should be modularly packaged and somewhat mobile, based on the mission, the threat, and the environment. Where

human misery, despair, or carnage are prevalent, medical support should include both mental and physical wellness capabilities. Also, knowledgeable managers are needed at port operations elements to handle shipments of drugs (many of which require positive control) and medical supplies (some of which may require refrigeration, such as whole blood).

- **RECREATION:** Troops eventually have the desire to "let off steam" in sports competition or games. Reading materials, cards, and board games also give soldiers the opportunity to focus their thoughts away from the rigors of the mission or the environment. Videos of recent movies and sports events are also a consideration.
- **PERSONAL HYGIENE:** Troops should have a hot shower on a fairly regular basis, and expect it if they are not engaged in combat operations.
- **BILLETING AND WORK SPACE:** In combat, troops tolerate pup tents and fox holes. However, in a static, ongoing, noncombat operation, living and working environments should be improved somewhat as the operation progresses.

These are areas which have an immediate impact on troop morale – and which the command can address in planning. If the contingency becomes an extended operation, additional soldier support programs should be considered, such as R&R trips, Armed Forces Radio and Television Service (with live coverage of major news and sporting events), and in-country entertainment programs or concerts. These require coordination beyond the command's initial operations planning.

B. Tactical Factors

- No individual or team can practice or train too much or too often.
- Teamwork is the key to success and will only come through constant training and rehearsal.
- If you show confidence, your team will have confidence.
- Always have an alternate plan. Think ahead.
- If you lose your temper, it will affect your judgment. Keep cool!
- Don't be afraid to take advice from your team members.
- Realism must be injected into all phases of training.
- Conduct at least half of your training at night.
- Teams that have a good physical training program have fewer health problems.
- Have a pre-mission and post-mission checklist to ensure that nothing is left behind.
- Correct all personal, individual, and team errors on the spot.
- Use tact when reprimanding your personnel. If possible, take the man aside to criticize him. This enables him to react positively to the criticism, since he will not lose face, feel ridiculed, or lose self-confidence.
- Conduct English classes for your indigenous personnel, especially interpreters. Conduct classes for U.S. personnel in your indigenous team members' language.
- Don't set patterns in your operations.
- Never do the obvious.

- On patrol, stay alert at all times. You are never 100 percent safe until you are back home.
- Have team members write down tips and lessons learned, and collect and consolidate them at the end of each mission.

C. Uniform and Equipment Factors

- Wear desert camouflage BDUs on operations. Even when soaking wet at night, BDUs are remarkably "invisible" to NVGs.
- Do not use luminous tape. It is easily spotted at long distances with NVGs.
- Wear loose-fitting and untailored clothing on field operations. Tight-fitting clothing often tears or rips, allowing insects easy access to exposed parts of the body.
- Tuck your jacket into your pants. You can't use the lower pockets because of your LCE anyway and, in contact, you can temporarily stuff expended magazines inside your shirt.
- Wear gloves to protect hands from insect bites, provide camouflage, and aid in holding a weapon when it heats up from firing. Aviator's nomex gloves work well.
- Sew in a section of VS-17 panel inside your fatigue shirt for use as an emergency daylight position marking signal to friendly aircraft. In the center of that, sew a 2"x2" piece of USAF "burn tape" for use as a nighttime position marking signal to AC-130 gunships (2"x2" is the size recommended by the AC-130 low-light/night television operators).
- If your mission requires long ropes, consider the use of 1" nylon tubing instead. It is lighter, more compact, and just as strong.

D. LBE/Ruck Tips

- Be sure that all snaps and buckles are taped. Do not use paper tape.
- Always carry a sharp knife or bayonet on patrol.
- Always wear your LBE buckled when not sleeping. If you're wounded, your teammates can drag you by your LBE shoulder straps.
- For survival, each individual should carry a cut-down MRE in his pants' cargo pocket, and one tube of bouillon cubes in the first aid pouch on his LBE. One bouillon cube dissolved in one canteen of water will provide energy for one or two days.
- Don't use 2-quart canteen covers to carry 30-round magazines. You can fit eight mags in one, but once you take the first mag out, the others rattle loudly and spill out easily. Use regular ammo pouches.
- Snap the snap link on your rucksack through the loop in the upper portion of your rucksack carrying straps or the frame so you won't lose it during exfil when you snap it on a ladder or extraction fastrope.
- Insect repellent leaks and spills easily, so put it in a ziplock bag and isolate it from your other equipment in the rucksack. Also, squeeze air from the repellent container and screw the cap on firmly.
- Always use the water from canteens in or on your rucksack before using water in the canteens on your belt. This will ensure a supply of water should you ditch or lose your rucksack.

- Test the shoulder straps on the rucksack before packing it for patrol. Always carry some parachute cord to repair straps on patrol.
- Use a waterproof bag in the rucksack to protect equipment while on patrol.
- Camouflage your rucksack with black spray paint.

E. Night-Vision Goggles (NVG) Tips

- At night, carry NVGs in a claymore bag around your neck on your chest. This allows easy access and protects the NVGs from the elements.
- Always carry a spare battery for your NVGs.
- When in an OP at night, scan with NVGs only for a few moments every five minutes or so. If you scan continuously, you increase the chance of the enemy spotting your position. (When two persons using NVGs in the passive mode look directly at each other, they will see glowing "cat-eyes" caused by retro-reflectivity.)
- When moving at night, only every other man should wear his NVGs. Point and trail always wear NVGs.
- The point man wears a PVS-5/7 NVG and the slack (the man behind the point) uses a TIS.

F. Weapons Tips

- Never assume that your weapon is clean enough on an operation. CLEAN YOUR WEAPON DAILY.
- Always carry rifle-cleaning equipment on operations – bore and chamber brushes, cleaning rag and patches, cleaning rod with handle and tip, and a small vial of weapons oil. A shaving brush is very useful.
- When you fire your weapon, shoot low, particularly at night. Ricochets will kill just as well, and most people hit the ground when shooting starts.
- Use one magazine full of tracer during infiltration and exfiltration. If taken under fire during infiltration or exfiltration, the tracers can be used to identify enemy positions to friendly air support.
- The last three rounds in each magazine should be tracer to remind the firer that he needs a fresh magazine. Alternative: The last eight rounds are three tracers followed by five balls.
- Oil the selector switch on your weapon daily and work the switch back and forth, especially during rainy season. This will prevent the common occurrence of a stuck switch.
- Always carry your weapon with the selector switch on "safe."
- Use a plastic muzzle cap or tape to keep water and dirt out of the barrel.
- To improve noise discipline, tape all sling swivels.
- Rig the jungle sling so it is easily adjustable (for easy transition from rappel/fastrope to carry/fire). Tape a spare field dressing to the sling at the stock, using a single strip of wide cloth tape with a quick-release tab.

- Check all magazines before going on an operation to ensure they are clean, properly loaded, and the springs are oiled and functioning. Magazine problems cause the majority of weapons' malfunctions.
- Place magazines upside down in your pouches to keep out dirt and dust.
- Do not retrieve your first expended magazine during contact because it will consume valuable time.
- If you use a PAQ-4 aiming light on an M16A2 rifle, you must modify the handguard to allow the thumb switch to travel far enough to activate the light. Using the serrated edge of your bayonet, file down the area under the thumb switch (between the eighth and tenth ribs from the slip ring) about 1/4". This is not a problem on the M16A2 carbine because the handguard is smaller.

G. SAW Gunner Tips

- Silence ammo in plastic drums by making inserts from tablet-back cardboard covered with acetate. Cut to fit two per drum.
- When moving, use a 30-round magazine in the SAW. Attach a drum in the ORP or once in position in a hasty ambush.
- SAW drum pouches are tightly fitted and tend to pop open when you drop into the prone. Use cloth tape with quick-release tabs to prevent this. The 2-quart canteen covers are acceptable substitutes.

H. Claymore Tips

- Claymores are factory-packed "backwards;" i.e., to be emplaced from the firing position to the mine position, with the excess wire left at the mine. This is corrected by removing all the firing wire from the plastic spool, discarding the spool, re-rolling the wire in an "S" or "Figure 8" fashion, and replacing it in the bag to enable the mine to be emplaced first and the wire laid back to the firing position. The clacker with circuit tester attached is preconnected to the firing wire and stowed in the mine pouch. The unit commander must make the decision to either prime the mine before departing on the mission, or to only put the shipping plugs on the electric and nonelectric blasting caps to speed priming during emplacement.
- Dual-prime each claymore for both electric and nonelectric firing. The time fuses should be pre-cut for 30-, 60-, or 120-second delay for pursuit/break-contact situations. However, the burn time on the fuse becomes undependable the longer the fuse is exposed to wet/humid conditions.
- Waterproof your nonelectric firing systems.
- Carry the claymore in the rucksack so it is immediately accessible and so that after breaking contact, it can be quickly armed and emplaced on the back trail (even while it is still in the ruck) to delay pursuers.

- When placing claymores around your position (OP, ambush, RON, etc.), they should be emplaced one at a time by two men: one man emplacing the mine and the other standing guard.
- Never emplace a claymore in a position that prevents you from having visual contact with it.
- Because you only emplace a claymore where you can observe it, you may consider cutting your firing wire in half since you will not use more than 50 feet/5 meters of wire, easing emplacement and recovery and cutting weight.
- Emplace each claymore so the blast parallels the team, and the firing wire does not lead straight back to the team position from the mine. If the claymores are turned around by the enemy, they will not point at the team.
- Determine in advance who will fire each claymore and who will give the command or signal to fire.

I. Grenade Tips

- Make continuous daily checks on all grenades when on patrol to ensure that primers are not coming unscrewed.
- Do not bend the pins on the grenades flat. The rings are too hard to pull when needed.
- Fold paper tape through the rings of grenades and tape the ring to the body of the grenade. The paper tape will tear for fast use, while plastic or cloth tape will not. It also keeps the ring open for your finger, stops noise, and prevents snagging.
- All team members should carry a mixture of fragmentation, CS, and WP grenades on their belts for the following reasons:
  - Fragmentation grenades are good for inflicting casualties.
  - CS grenades are ideal for stopping or slowing down enemy troops and dogs pursuing your team and are effective in damp and wet weather, whereas CS powder will dissipate.
  - WP grenades have a great psychological effect against enemy troops and can be used for the same purpose as CS grenades. The use of CS and WP at the same time will more than double their effectiveness.
- Thoroughly train and test your indigenous troops in grenade-throwing, particularly WP. Not all of them might be adept at baseball-style throwing or be able to get much distance.
- Violet and red are the smoke colors most visible from the air.
- Notify aircraft before signaling with WP. Gunships or fighter-bombers may mistake it for a marking rocket indicating an enemy position and attack you.
- Camouflage smoke, CS, and WP grenades, using black or OD spray paint.
- Smoke grenades should be carried in or on the pack and not on the LBE. You do not fight with smoke grenades, and if you need one, 99 times out of 100, you will have time to get it from your pack.
- Each team should carry one thermite grenade for destruction of either friendly or enemy equipment.

SECTION V: HELICOPTER OPERATIONS IN THE DESERT

Following are comments on desert operations made by Colonel Tackaberry, Commander, 24th Aviation Brigade, 24th ID(M), during Operation Desert Storm. Tackaberry's peers and subordinates told him that putting helicopters in the desert could not be done.

> "The plan was for the helicopters to remain at Dhahran Airport. But my heart and my gut said this was wrong," Tackaberry said. "We had to be where the Division was. If we were to be a maneuver brigade, we had to be responsive to them, not back there at some big airport. If we were to be a maneuver brigade, then we had to be there with the other maneuver brigades."
>
> Tackaberry studied a map and spotted a site called Thadj, about a 45-minute flight in a UH-60 north-northwest of Dhahran. It was merely an old, dirt airstrip in the desert, surrounded by nothing but, in Tackaberry's words, "scorpions, viper snakes, cobra snakes, and sand."
>
> He was told the OH-58D couldn't make it; that the Army had trouble just keeping the Apache flying in the United States; that the UH-1 couldn't operate out there; and that the UH-60 couldn't survive, that its blades and APUs would be eaten alive. "Now I grant you that we had problems," Tackaberry admitted. "Within three weeks of getting there, we had our aircraft on the ground for two reasons: parts and menta1 attitude. But the parts began to come in, and we began to lick the mental problem. We didn't fight the desert, we learned to live in the desert. We did a Black Hawk phase check just 10 days after the first week of being out at Thadj. We pulled maintenance at 0400 in the morning, and sent the guys to sleep in the evenings. So we learned to live there and train there."
>
> "The harshest and most difficult flying I have ever done was in the desert," Tackaberry added, "and it was done at night under *NVGs* -- a real credit to our training methods. We learned you can mature quickly in a place like that, then be ready to go to war."

Flying in Afghanistan presents a list of difficulties: dust, primitive living and working conditions, and high altitudes in the region's extensive mountain ranges. When landing on soil or sand, helicopters are susceptible to brownout – thick clouds churned up by the rotors' downdraft that can block a pilot's vision and cause vertigo. Following are typical problems experienced by aviation assets during operations in a desert environment.

A. Blade Erosion. Blade erosion degraded mission performance. Blades made of composite materials to save weight and enhance survivability were literally melting under the hail of sand.

Blade maintenance was difficult to perform in the field environment. The following blade protection maintenance problems were encountered.

1. **Rotor Blade Erosion.** Helicopter rotor blades were being severely affected by erosion from sand and dust. The UH-60, in particular, experienced erosion problems that rendered main rotor blades unserviceable in as little as 25 flight hours if not treated with erosion protection. AVSCOM procured two rotor blade erosion kits for protection against the harsh environmental conditions in Saudi Arabia. The first kit was an interim kit using a polyurethane paint. A second preferred kit used polyurethane tape on the leading edge of blades. The application process was not extremely difficult, but conditions must be suitable and it is time consuming. The application was labor intensive. Taping developed bubbles which broke and filled with sand, creating an out-of-balance condition. The taping did not last long and was easily destroyed by rain.

2. **L-100 coating (Tail rotor).** The application was labor intensive, required a clean environment, and was difficult to apply. The time required for application depended on temperature and moisture. If hot and dry, the coating would normally spread unevenly due to the drying speed, with approximately half the can being wasted. If cool and moist, more time was available for application. The coating did not last long, came off unevenly, and created an out-of-balance condition. Some tail booms were replaced due to vibration effects. The application/reapplication usually required the balancing/rebalancing of tail rotor blades.

Special operating procedures developed to minimize sand ingestion/blade erosion.

- Hovering was avoided as much as possible.
- TADS/PNVS was stowed for landings.
- Run-ups were limited to approximately 5 minutes.
- ENCU and ALQ-144s were turned off prior to take-offs and landings.
- "Blind" shutdowns (no APU) were performed to minimize APU usage due to the number of APU failures.
- Prolonged ground operations were conducted at engine idle.

B. Aircraft covers. Extreme heat, dust, and blowing sand caused premature failures on critical aircraft components. Blowing sand renders glass and acrylic surfaces unserviceable. AVSCOM initiated a review of possible aircraft covers for use in high temperatures with windblown sand and dust. Units should take all issued covers and any available material or coverings that provide shade for conducting maintenance or protect components from blowing sand and dust.

C. Operations in heavy dust conditions. Brown-outs were a constant hazard. Recommendations:

- Saturate LZs/PZs with diesel or oil to minimize brown-out conditions.
- Purchase and field rubberized matting sections to construct improved landing zones.

- Augment engineers with tanker vehicles and dust control spray to provide the unit with internal dust control capability.
- Ensure aircraft engine and APU intakes have improved particle filtration systems.
- Rotor blades need improved erosion guards capable of sustaining operations in the sand.

D. Engine performance was degraded due to sand ingestion. Special procedures were developed to minimize sand problems.

- In-flight HIT checks were accomplished or, in some cases, not done at all.
- Take-offs were expedited; max performance take-offs were accomplished when possible.
- Landings (running) were made to the ground.
- Turbine engines and rotor blades were particularly affected, with the life expectancy of an aircraft engine reduced from 1,000 to 1,500 hours to as low as 40 hours.
- To reduce engine wear, the first initiative was to limit the exposure to take-offs and landings in the sand. While tough to do in the desert, landing areas were scrutinized to use the least sandy spots, and heavy use landing areas were improved with the use of diesel or slurry-tar mixture to reduce dust. Some aircraft, such as the UH-1 and AH-1, which lacked a particle separator, were restricted to hard-stand operations for training until improved particle separators were obtained and installed.

E. Night-Vision Systems. Although the night-vision devices/systems enhanced the capabilities of aircrews to fly in the night environment, the ANVIS 6 night-vision goggles (NVGs) proved inadequate for the SWA desert night environment.

- Low moon illumination - With moon illumination levels at 20-30 percent or less, the terrain contrast/definition was inadequate for NVG operations for most units.
- High moon illumination - With moon illumination levels at 85-100 percent, the NVGs had a tendency to "white out;" that is, shut down due to the brightness.
- Moon shadows - With moon angles of 23 to 60 degrees and illumination levels of 30 percent or greater, coupled with the moon positioned to the front or side of the aircraft (approximately 9 o'clock-3 o'clock position), crews could pick up shadows and use the contrast for terrain definition. However, with the moon to the rear quadrants (4 o'clock-8 o'clock position), the moon shadows either could not be picked up or were difficult to see. This caused terrain blending, making it extremely difficult to discern increases/decreases in elevation sloping, small buttes, and hills.

F. Training. Aircraft were restricted to a minimum of 150 feet during training for safety reasons. When the war began, pilots were expected to fly at altitudes of 50 feet and below. Pilots felt uneasy due to a lack of training at the lower altitudes. Night operations at low altitudes were extremely difficult in a desert environment without training.

G. Altitude problems. Terrain definition was extremely difficult, if not impossible, to discern at altitudes above 80 feet AGL due to a lack of terrain definition. At altitudes below 50-80 feet, AGL rises in terrain elevation are difficult to identify causing potential problems with flying into sand dunes. Many pilots used the IR searchlight as an aid to enhance terrain definition. The dilemma was, Do you fly low with an active IR source (hoping the enemy lacks the sophistication to pick up the source), or do you fly high (above the environment, hoping the enemy lacks radar coverage)? Some helicopters will have difficulty reaching altitude in mountainous regions.

H. Navigation

- Maps were old and lacked accuracy.
- The Doppler navigation system proved inadequate in the SWA desert environment due to a lack of terrain features and landmarks for waypoint updating.
- The LORAN navigation system was inconsistent (frequent loss of signal), and the update rate is too slow.
- The GPS navigation system (or one like it) is needed to provide accurate updates.

I. Aircraft Survivability Equipment

- ALQ-144/144As failed repeatedly. The bearings would fail due to sand ingestion. Mirrors were also broken due to flying debris.
- ALQ-156 flares went off inadvertently around approaching aircraft, microwave towers, or Patriot missile systems.
- APR-39 (all types) information was too confusing to interpret, especially during high workload tasking.
- APR-39(A)V1 had poor voice quality, talked too much, gave false alarms, and was difficult to interpret. Ground Surveillance Radars (GSR) would activate the APR-39(A)V1 as ZSU-23-4s. Many crews chose to disregard the system. Crews were not sure of ASE suite effectiveness.

J. AH-64 Desert Operations Lessons Learned

Hellfire (HF)

- The HF missile system was extremely lethal when targets were hit. All targets engaged by the HF, to include the new sophisticated armor systems, were easily destroyed when hit.
- Specific engagement data was collected on 200 HF shots: 127 hit their intended targets, while 73 missed. Percentage of targets engaged that were hit/destroyed: 63.5.
- HF engagements were difficult to complete in a smoke, fire trench, rain, or fog environment.

- LOBL engagements were not as effective as LOAL engagements due to a backscatter problem. LOAL direct became the preferred method of engagement.
- A-model HFs were not as effective as C-model HFs.
- The A-model HFs would leave a cloud of smoke on departure when the temperature dewpoint spread was small, causing the crew to temporarily lose the missile.
- Some units cleaned their HFs after every flight to dislodge any rocks/pebbles from the canards/fins.
- Running fire (airspeeds above effective translational lift) was the preferred method of engagement. It was used to minimize sand/rock FOD problems.
- De-ice domes were not available in the majority of units.

Rockets

- The MK66 MPSM rockets had high success rates out to extended ranges. One T-55 was destroyed by MPSM. MK66 HE rockets were not as accurate as MPSM.
- MK40 rockets are not very accurate.
- Rockets would not properly inventory; suspect poor contact between the launcher and the rocket. Umbilical cords (for remote fuze settings) were tightened to reduce the chance of interference with other rockets.
- Rocket pods were cleaned often to minimize sand problems.

30mm Gun

- The 30mm gun systems were very lethal and destroyed targets at ranges out to 4 kilometers when accurate. One T-72 turret (rear portion) was penetrated by 30mm HEDP rounds.
- The 30mm gun system frequently jammed due to:
  - Sand ingestion.
  - Round casings lodged in feed mechanism.
  - Fuzes backed off of M789 rounds.
  - Drive motor seizures.
  - Broken carriers.
  - Loose feed chutes.
- Gun jams were minimized mostly by:
  - Preventive maintenance - cleaning on a continuing regular basis.
  - Reduced loads - loads of only 400-600 rounds minimized stretching and bending of flex chutes.
  - Accuracy - Outfront harmonization was used in one battalion and improved the accuracy for those gun systems.

- Uploading/Downloading:
  - 30mm loading took too long (as long as 2 hours).
  - Gun loader design is poor - holes were dug under aircraft in order to use loader.
  - Drive motors were too weak - should be upgraded.
  - Flex chute stretched, bent, and broke too easily.

Sensors

- The sensors provided the capability to detect, engage, and destroy targets out to 8 kilometers.
- Smoke degraded the capabilities of the DTV and FLIR; however, the FLIR did provide the capability to engage some targets in smokey conditions.
- Detection ranges were sufficient.
- Target identification was difficult; crews had to move close to threats (within 2-3 kilometers) for FLIR identification, with slightly longer ranges for the DTV.
- Direct-view optics (DVO) were rarely used by the CPG.

Night Vision Systems

- The AH-64 was the only Army aircraft capable of flying and fighting in the entire nighttime spectrum. When other aircraft crews were not flying due to low illumination levels, the AH-64 was engaging targets in the darkest of nights.
- The front seat pilotage using TADS is not adequate for night flight. A PNVS capability needs to be provided for both crews.
- Rain degrades the PNVS performance (provides uniform cooling).

AH-64 Equipment Design

- The CPG heads-out display (HOD) is too small and provides insufficient clarity for target recognition in most cases. CPGs often ask the pilot for assistance on their video display unit (VDU) which is larger and has better clarity. The crews suggest removing the optical relay tube (ORT) and adding a larger display in the front seat, possibly with color.
- The ORT is a safety hazard in any crash sequence.
- The crew seats are uncomfortable on extended flights.

Communications

- Crews had to rely on OH-58 aircraft to relay radio traffic due to the limited range of the fielded avionics package.
- Directionality - The positioning of antennas created blind spots to the front and rear of the aircraft. Aircraft occasionally had to be rotated to communicate with other crews and ground units.

K. UH/EH-60

Weapon Systems

- The wind drag (outside aircraft) made the operation of the M-60D very difficult. The system cannot be stowed inside the aircraft once it is on the outside.
- The M-60D is difficult to load once it goes outside.
- Sand ingestion required additional maintenance time to clean the weapon system.

Aircraft Survivability Equipment (ASE)

- Chaff dispenser was unreliable and not always available.
- Flares were positioned to activate directly downward, and coupled with low terrain flight altitudes, could degrade its effectiveness as a decoy.

Equipment Design

- The field of view from the cockpit is too restricted.
- The aircraft does not have a cargo net system for securing internal cargo.
- The APU needs an IPS system.

L. OH-58D

Aircraft Performance (General)

- Aircraft could not keep up with the AH-64 due to speed differentials.
- Power margins were minimal when flights were conducted at high PA/temperatures.

Sensors

- Remote HF designations were successful, although a few laser problems were experienced.
- Detection ranges were adequate.
- Crews had to reposition within 1-4 kilometers to correctly identify targets as threat systems.

M. Aviation Maintenance Operations

- Maintain forward presence by jumping support bases forward. The goal was to provide one set FARP at all times while simultaneously maneuvering the bulk support forward behind the ground units.
- Need for increased mobility and flexibility. Vehicles and equipment had to hold up under the harsh desert conditions; and individual operators had to be able to use their equipment to its maximum potential under the worst conditions, requiring in-depth and extensive maintenance.

- Develop maintenance packages which combine a support package for the line troops.
- Maintenance package includes an armament team, airframe mechanics, and a technical inspector (TI). This package is designed to quickly repair on-site problems, particularly at the forward arming and refuel point (FARP).
- Provide a battle damage assessment and repair (BDAR) team to provide rapid aerial response to downed aircrews. BDAR team includes a helicopter to transport a test pilot, avionics repairman, airframe mechanics, TI, and a medic.
- Provide an OPCON aviation intermediate maintenance area (AVIM) contact team to provide minimum AVIM on-site support. The team requires no special test equipment or PLL. This team completes AVUM/AVIM maintenance, which requires a stable work area.

SECTION VI: SOLDIERS LOAD IN A DESERT ENVIRONMENT

> "The machine has made warfare ponderous but has also given it greater velocity . . . it is conspicuous that what the machine has failed to do right up to the present moment is decrease by a single pound the weight an individual has to carry in war."
>
> -- S.L.A. Marshall, ***The Soldiers' Load and the Mobility of a Nation***

The fighting capability of an infantry soldier is directly related to his load. There is a maximum individual load limit that cannot safely be exceeded if an infantry soldier is expected to accomplish his combat mission. The following examples demonstrate how important it is for commanders to understand their responsibilities for lead planning and load discipline.

- The weight a soldier can carry is based upon his weight, the climate, the terrain over which he will move, and the stress he has faced and is currently under.
- Units must consider the environment, weather, mission, and soldier requirements prior to initiating the mission with definitive items that compose the soldier' load. Each mission will require a study of the essential items that are necessary for survival and combat operations.
- No amount of training can change the body's reaction to carrying excessive loads. The commander's involvement analyzing the situation and the level of risk involved is the key to carrying only what is mission essential.
- Vehicles will not always be available for the light fighter to carry his essential loads of ammunition, food, and equipment.
- The fighting load for a properly conditioned soldier should not exceed 48 pounds; the approach march load should not exceed 72 pounds; the weights include all clothing and equipment, either worn or carried.
- Overloading the soldier can get him killed. Develop a unit SOP which strictly limits what is carried on combat operations and exercises, and enforce those limits.

- Fatigue is the infantryman's life in the field. Without rest or support, fatigue can reduce an effective unit to a leaderless gaggle even in the most benevolent terrain. With rough terrain and bad weather, the effects of fatigue multiply exponentially.

- **The average rifle platoon soldier's load at the JRTC is 91 pounds.**
- **The average cold weather soldier's load is 101.5 pounds.**
- **The average warm weather soldier's load is 88.3 pounds.**
- **The average difference between cold weather and warm weather at the soldier level is 13.2 pounds.**

- Soldiers carry extremely heavy loads even in warm weather. That weight slows movement down and fatigues the soldier faster than if the platoon went into combat with a lighter load.

Bottom line: Soldiers need a packing list that makes sense.

Carry what is required for mission accomplishment, but allow a minimum of comfort items. Train your CSS operators to make up the difference. Leaders, beginning at the team level, should conduct good PCIs to enforce that the packing list is adhered to. A sample of a packing list is provided on page 44, including the weight of everything a soldier might wear or carry. In this suggested list, "worn" includes the uniform, boots, etc., not normally weighed. There are four configurations with this type of packing list and load:

Fighting load - Only what is worn = 36.9 pounds
Fighting light - Worn plus the assault pack = 59 pounds
Approach march - Worn plus the rucksack = 72.9 pounds
Everything - Worn plus the rucksack and assault pack = 95 pounds

SAMPLE PACKING LIST

RUCKSACK	*ASSAULT PACK*	*WORN*
Rucksack with frame (large)	Assault pack with straps	LBV / LCE harness
Waterproof bag	Waterproof bag	Pistol belt
5 pair socks	2 pair socks	2 x 1 qt canteens (full)
3 x T-shirts	1 T-shirt	2 x 1 qt canteen covers
Poncho	Poncho liner	Canteen cup
Rain parka	2 x MREs	Compass with case
Rain trousers	Ammunition	6 x 30 round magazines
Shaving kit	2 x razors	Kevlar helmet complete
10 x razors or AA elec razor	Weapon cleaning kit	*Serviceable BDUs*
Deodorant	Handle section	*Brown T-shirt*
1 bar soap w/container	3 x rod section	*Socks*
Foot powder	Bore brush	*Boots blackened*
Toothbrush w/container	Chamber brush	*ID tags taped*
Toothpaste	Swab holder	*ID card*
Shoe shine kit	Toothbrush	*Notebook*
Black shoe polish	Swab pads	*Pencil or pen*
Brush & applicator	Oil - CLP	Map
1 brown Army towel	Sleep shirt	Protractor
1 brown Army washcloth	Night vision device	Weapon - clean and oiled
2 qt canteen clean and full		Black gloves
2 qt canteen cover	**1 x AT4 = 14.8 pounds**	2 x snaplinks
E-Tool - black and serviceable	**2 x 60mm rds = 4.0 pounds**	First-aid pouch
E-Tool case		
Poncho liner		*Italics - Not previously weighed at JRTC*
5 x MRE (stripped)		
TOTAL = 36 pounds	**TOTAL = 22.1 pounds without AT4 or 60mm rds**	**TOTAL = 36.9 pounds With uniform items / italics**

Total load of soldier with ruck, assault pack, LBE, K-Pot, weapon, and uniform would be approximately 95 pounds, not counting AT4, 2x 60mm rounds, Gortex, airborne items, or poly-pro underwear. Bear in mind, the idea is to drop rucks and operate during patrolling with assault packs or the fighting load, then come back to rucksacks during hours of darkness and set up ambush sites or resupply for missions.

SECTION VII: INTEGRATION OF SOF AND CONVENTIONAL FORCES

The contemporary operational environment (COE) timeline looks at shaping the battle area, deployment of forces to the area, decisive operations to achieve victory, and stability or support operations that follow. Those COE phases are not distinct events with clear bookmarks to evidence when one phase ends and another begins. They may be – and often are – both sequential and parallel.

Special Operations Forces (SOF) offer combatant CINCs capabilities that are not only rapidly deployable, but also uniquely flexible across the full spectrum of operations. SOF will be on the ground before any conventional force deploys. SOF can reinforce, augment, and

complement conventional forces. SOF operate independently in missions that demand small, discrete, highly trained forces. Initially, in Afghanistan, SOF was the main attack while conventional forces were the supporting.

The key to effective SOF integration in conventional operations is the deployment and use of a Special Operations Command and Control Element (SOCCE). The SOCCE is critical in teaching Army service leaders how to integrate with SOF. Aside from FID missions, SOF mission profiles also include unconventional warfare (UW), guerilla warfare (GW), direction action (DA), special reconnaissance (SR), and coalition support (CS).

The fusion of SOF and conventional fits neatly on the COE event timeline when operations shape the battle area, cover deployment, achieve a decisive goal, or maintain stability in the area.

SECTION VIII: MILITARY OPERATIONS IN URBAN TERRAIN (MOUT)

Hue City. Beirut. Mogadishu. Grozny. Since the end of the Second World War, the population of the world and its conflicts have increasingly moved from the rural countryside to modern cities and urban sprawl. The U.S. Army has found itself on this new battlefield, and greater training emphasis is shifting to these likely future conflicts. There is no end in sight to the Army's increasing commitment to this role.

Buildings in the urban setting provide excellent cover against small arms rounds or concealment that masks sandbagging and other force protection steps taken by the defender. With the exception of downtown cities, buildings are usually separated by open streets and sidewalks that provide little to no cover for the attacker. On the other hand, excellent fields of fire are available for the defender, although engagement distances are almost always 100 meters or less. Because adjacent buildings are much closer than 100 meters to each other, seizing a foothold in one will probably require suppression or obscuration of several. For the defender, winning the MOUT fight requires making the fight as unfair as possible in the first place. A good way to do this is to defend from buildings that provide cover and concealment for friendly weapons, and fields of fire into streets and engagement areas that offer the attacker fewer targets.

For riflemen and team leaders, the fight is to seize a foothold in a given building and clear individual rooms. At the squad level, the fight is for a floor or a single small building. The platoon fight revolves around larger buildings and small city blocks. At all levels of this fight soldiers will be crossing open areas and securing footholds. The platoon level is the lowest level where we begin to see enough combat power to assault buildings, while still being able to suppress as well as provide all-around 360^{o} security. This fight requires coordination – coordination gained through fire control and distribution, sectors of fire, and fire and maneuver tailored to a MOUT environment. The team leader/squad leader fight frequently focuses on close quarter battle (CQB) tactics to clear rooms; to assault streets, the squad requires support from the platoon to be set up for success.

Generally speaking, there are three weapons systems that cause almost all casualties among units in the MOUT attack: mines and booby traps, indirect fire (usually 82mm mortars), and direct fire from small arms. Direct fire is commonly caused by:

- Direct fire at a soldier clearing a building, or fire directed at a stationary soldier inside a friendly-held building. Ricochets from the 5.56mm and 5.45mm assault rifles cause a high portion of direct fire casualties to the employing force.
- Enemy soldiers inside a building defending themselves from a friendly assault (friendly troops in the open).
- Enemy soldiers in a building engaging friendlies in the open. The friendly troops are attacking a different building, or are otherwise unaware of the source of the fire.

The enemy hits two or three out of every four casualties when they are not clearing or moving inside buildings. To reduce casualties and increase the chances for mission success, we must either:

- Avoid those areas where casualties are most likely to occur.
- If we can't avoid them, spend as little time in them as possible.
- Implement TTPs to better protect soldiers moving through them.

There are three steps at the platoon level to an attack in MOUT:

- Isolate the building.
- Secure a foothold.
- Clear the building methodically.

Isolate:

Isolate is the first step in seizing a building. Isolation is defined in **FM 90-10-1,** ***An Infantryman's Guide to Combat in Built-Up Areas,*** as "seizing terrain that dominates the area so the enemy cannot supply or reinforce the defenders." There are two ways, basically, to isolate a building: by completely surrounding the building on all sides, or with fire. Fire is easier, faster, and far more common. By advancing to the flanks of the building, units can use interlocking fire to prevent the enemy from reinforcing or retreating. If units do not do this, the enemy can easily reinforce the building under attack, or withdraw and fight another day if threatened. Isolation is very important if units are going to use second-story entry techniques and fight "top down." The danger of top down fighting is the lack of logistics support and the possibility of the unit being trapped without supplies. Isolation of the objective allows units to use the terrain to their advantage. The defender is pushed out of his building, where he has cover and concealment, into the open where he has neither and can be easily destroyed. This requires good adjacent unit coordination and cross-talk. In limited visibility operations, it requires the use of NVGs and weapons' sights to their full capability. The night, which makes it easy to approach and gain entry, makes it easier for the enemy to escape as well.

Mortars are another way to isolate a building with fire. Close-in fires can prevent the enemy from moving in and around the objective. Units will still have to secure a position that allows them to observe the rear of the building to provide observed fires. If not, they will need ammunition to fire continuously, and should plan accordingly.

Securing a foothold:

First, identify the foothold by designating the entry point for the building. Next, identify the route from the last covered and concealed, or assault position, to the building. This is usually the shortest distance, immediately across the adjacent street, back yard, or alley. A critical step at this point is for the soldier to ask, From what enemy-held buildings can the enemy observe my avenue of approach?, then orient observation and fires on those points to break the mutual support between enemy positions. Being able to predict suspected enemy positions by reading the terrain is an important skill to develop.

By looking at the avenue of approach to the entry point from the enemy perspective, it can be determined which buildings and suspected positions are the greatest threat. Sectors of fire can then be assigned that direct friendly shooters at the identified enemy-held buildings. The purpose behind assigning these sectors of fire is to allow the assault team to get that foothold of a room in a building. It takes time to identify the enemy buildings, designate sectors of fire, and make sure everyone understands the plan.

Moving across an open area to assault a building is one of the most dangerous events in MOUT. In this case, remember the sequence "slow-fast-slow:"

- Slow, detailed planning with dissemination of the plan to squad and team leaders.
- Fast movement across enemy kill zones (supported by fire).
- Slow, thorough clearing of the enemy-held building. It is better to spend the time necessary while covered and concealed in a friendly building than out bleeding in the street.

Breaching:

There are two types of obstacles a soldier might face: existing and reinforcing. At the platoon level, the most common types of obstacles are (1) mined wire obstacles emplaced by the enemy outside the building, and (2) the doorway, window or wall a soldier must pass through to seize the foothold itself. The best way for a soldier to enter, ROE permitting, is to make a hole through the wall. Next best way to enter a building is through a window, with doors being the least preferred way. If the friendly- and enemy-held buildings are adjoining, "mouseholing" with demolitions is preferable; otherwise, AT4s, LAWs, or other munitions should be used from the safety of a building, rather than out in the open emplacing explosives by hand. Caution should be taken, however, when firing AT4s and LAWs from inside a building since they can bring the ceiling down on the firer's head or set the room on fire, particularly in Afghanistan. An effective technique, and one used by Chechens in Grozny in 1994, is to task organize "teams" under an NCO. Using pair or volley technique, a breach can be rapidly made, and provides the enemy the least time in advance as a warning. Hollow charge weapons generally are not designed to breach walls, and one may not be enough. High-explosive warheads (such as those in the AT8, SMAW, and Carl Gustav) have a better ability to breach masonry. Main gun rounds from tanks are very effective.

The breaching fundamentals SOSR (suppress, obscure, secure, reduce) will be helpful. Smoke grenades draw fire; at a minimum, the enemy can be expected to shoot blindly into the smoke cloud. Speed of movement and breaching minimize exposure times. Assault teams must

move fast and stay dispersed. If possible, do not stack outside the entry point. Get inside as quickly as possible.

Clearing methodically:

Once a foothold in the building is seized, the tactical problem for the defender changes. If the enemy is smart and is willing to trade space for time, he may elect to withdraw and take up the fight again on the other side of the next street or suitable clear field of fire, or reoccupy the building after the attacking force moves on. If the enemy regards the building as key terrain and is willing to fight for it, the fight does not end until the enemy is destroyed in the building. The defenders inside will shift their attention away from the support by fire (SBF) across the street and toward the assault force as it clears from room to room. On the other hand, defenders of adjacent buildings now know where the entry point is, if they can see it. Follow-on assault teams "run the gauntlet" to reinforce the foothold. There must be a plan for how follow-on teams will enter the building, and a senior leader within the platoon should play "traffic cop" to maintain intervals and dispersion. Fires from SBF positions should shift off the building, but still must focus on identifying and suppressing the enemy and protecting friendly reinforcements. Elements isolating the objective have a difficult task as well, and must be prepared for brief sightings of fleeting targets as the enemy makes his escape. Some shooters should stay oriented on the building until it is completely secured. While many platoons have SOPs that require them to mark every window and door, in reality this never happens. Room-clearing teams, in the heat of battle, have other things to do. Marking cleared floors and cleared buildings is a must, but there should not be an unrealistic expectation of what clearing teams will accomplish.

Moving in MOUT

Many units are adept at clearing rooms using the "stack" technique. Correctly employed, stacks allow units to dominate the room with overwhelming firepower in minimum time. One by-product of this is that leaders like to "stack" outside on the friendly side of buildings so they can control their soldiers better. There is a fine line between stacking and bunching up. It is not uncommon to see 5-10 soldiers stacked behind every friendly-held building where perfectly good cover and concealment is available on the other side of the very wall they are leaning against. This makes soldiers extremely vulnerable to snipers and airbursts from 82mm mortar fires. Platoon and company command posts, reserve squads, and casualty collection points are some of the biggest offenders. Good forward observers are aware of this trend and will act accordingly. In the terrain of urban combat, buildings offer cover and concealment from enemy fire and observation. They are the best avenue of approach through a city. Stacking outside buildings and moving around exterior walls are techniques that offer speed, but by considering buildings obstacles to movement, soldiers are put at risk. A reminder to units: If you're not doing anything, don't do it outdoors!

One technique that can have a great impact on the ability to defeat the enemy in MOUT is second-story entry techniques or fighting "top down." Clearing "top down" is an effective way to secure a building. Its chief advantage is that it keeps the attacker from being bottlenecked fighting up a stairwell and forces the enemy down to the ground floor and out into the open, rather than trapped in an upper floor where there is no alternative but to make a last stand. The chief drawback to second-story techniques is they are time consuming, and increase the time spent and vulnerability of solders in the open if buildings do not adjoin and soldiers are forced to use ladders or grapnels. Speed in getting inside a building may take precedence over entry onto an upper-level floor. If the enemy has the ability to observe the entry point, obviously assault teams will become extremely vulnerable. To clear "top down" requires detailed coordination. A unit must be able to secure the entry point from enemy fire. As related before, units attempting to fight top down and drive the enemy out into the street should take the time to cover enemy withdrawal routes with fire to prevent the enemy from escaping to set up a new defense.

Another caution in the top down technique is the possibility that the isolated force in the top down scenario may be in a trap where the entire building is destroyed to create the maximum number of casualties. IPB preparation is very important in MOUT.

Mortars in MOUT

> *Every potential foe on the planet watched CNN during Desert Storm, and saw what we did to the Iraqi forces. They also watched what happened in Somalia, and saw our nation's Achilles heel. Believe me, the lesson was not lost on them. They will fight us where they believe we are weakest....and they will fight us asymmetrically.*
>
> General Charles C. Krulak
> Commandant, United States Marine Corps

Mortars are valuable in providing indirect fire support during military operations on urbanized terrain. Indirect fire by FA has often been unavailable to infantrymen and in city combat due to building mask and lack of effective observation. Mortars have some distinct advantages during MOUT. The use of multi-option fuzes and several types of rounds increases mortar fire versatility.

- **Employment of Mortars.** Mortars are often the primary indirect-fire weapon for forward units in the assault or defense of a built-up area. Mortars can provide obscuration, neutralization, suppression, or illumination fires.
- In the offense, **proper mortar employment is vital to the success of any mission.** Mortars provide the offensive-minded commander with the ability to change the defender's advantages of overhead cover and physical obstacles into disadvantages.

- Light enemy overhead cover can be defeated with a **combination of the mortar's high angle of fire and multi-optional fuzes.** This ability to penetrate overhead cover makes the mortar the ideal weapon to defeat enemy positions in buildings. The mortar round must be able to penetrate the roof and top floor since experienced city fighters do not fight from the top floor.
- **Short fields of fire work to the disadvantage of the defender** by limiting his engagement capabilities. The defender is also vulnerable to unrestricted mortar engagement.
- **Mortar fires for rapid advance to a target area or for a systematic, building-by-building advance are identical** except for the firing restrictions given the mortars and the mode of support they are placed in. During a rapid advance, mortars are normally in general support; during a systematic building-by-building advance, they are in direct support of the lead element.
  - The attacking commander should ensure that his mortars have between one-third and two-thirds of their target engagement area beyond the forward edge of the target to obtain the best possible fire support coverage.
  - Forward observers should initially be on key terrain overlooking the target or with the forward element of the attacking force to engage targets of opportunity. Exact locations for the FOs are locations that allow the best overall fire support for the commander.
- **Delivery of Fires.** Mortar fires are **effective in the offense as well as in the defense.** The indirect fires are extremely responsive. Mortars are well suited for combat in built-up areas because of their high rate of fire, steep angle of fall, and short minimum range. Mortar fires can be used to inhibit enemy fires and movement, allowing friendly forces to maneuver to a position of advantage. Effectively integrating mortar fires with dismounted maneuver is key to successful combat in a built-up area.
- **Mortar fires are a critical and irreplaceable element** of the rifle company's maneuver. They either kill the enemy or suppress his fire, and thus allow the assaulting riflemen to close and kill him.
- Mortar fires alone cannot destroy enemy armor, but **contribute to the enemy's destruction** through synchronized action. Long-range HE fires force enemy armor to button up and reduce its speed of advance. HE and WP fires separate tanks from their dismounted infantry support, leaving them isolated and vulnerable to anti-tank weapons.

After the combined arms team wins the anti-armor battle, or is still fighting it around key engagement areas, friendly battalions face dismounted attacks by threat motorized infantry, day and night. The battalion commander uses mortar fires to **dominate and destroy** this enemy, while protecting and conserving the friendly force.

Positon Selection

Key considerations for the selection of positions include:

- The minimum range of the weapon.
- Terrain suitable for setting base plates.
- Dispersion and accessibility.
- Multiple firing sites and registration of each.

Mask and overhead clearance may initially be difficult to achieve due to a combination of building heights and minimum-range requirements. Position selection should be open enough to allow full coverage of the sector of fire without mask or overhead interference at minimum ranges. Often, parking lots or parks must be used to achieve required clearances.

The selection of mortar positions depends on the size of buildings, the size of the urban area, and the mission:

- The use of existing structures for hide positions is recommended (for example, garages, office buildings, or highway overpasses) to afford maximum protection and minimize the camouflage effort. By proper use of mask, survivability can be enhanced. If the mortar has to fire in excess of 885 mils to clear a frontal mask, the enemy counterbattery threat is reduced. These principles can be used in both the offense and the defense.
- Mortars should not be mounted directly on concrete; however, sandbags may be used as a buffer.
  - Use two or three layers.
  - Butt them against a curb or a wall.
  - Extend them at least one sandbag width beyond the baseplate.
- Rubble may be used to make a parapet for firing positions.
- Mortars are usually not placed on top of buildings because lack of cover and mask makes them vulnerable. They should not be placed inside buildings with damaged roofs unless the structure's ability has been checked. Overpressure can injure personnel, and the shock on the floor can weaken or collapse the structure.
- The problem of hard surfaces must be resolved when using parking lots. Mortars tend to bounce and be inaccurate unless baseplates are cushioned by sandbags or other soft materials. Carrier-mounted mortars are ideal for use on hard surfaces. Aiming posts can be placed in cans of dirt to keep them upright.
- The political climate may require that no-fire or limited-fire zones be set up to protect civilians, government buildings, and public utilities. Close coordination must be maintained between the forward unit elements and the mortar platoon to ensure no friendly troops are in the target area.

Communications

- **An increased use of wire, messenger, and visual signals will be required.** Wire should be the primary means of communication used between the forward observers, fire support team, fire direction center, and mortars since elements are close to each other.
- **FM radio transmissions in built-up areas are likely to be erratic.** Structures reduce radio ranges; however, remoting of antennas to upper floors or roofs may improve communications and enhance operator survivability. Another applicable technique is the use of radio retransmissions. A practical solution is to use existing civilian systems to supplement the unit's capability.

Magnetic Interference

In an urban environment, all magnetic instruments are affected by surrounding structural steel, electrical cables, and automobiles. Minimum distance guidelines for the use of the M2 aiming circle will be difficult to apply. To overcome this problem, obtain an azimuth to a distant aiming point. From this azimuth, subtract the back azimuth of the direction of fire. Index the difference on the red scale, and manipulate the gun until the vertical crosshair of the sight is on the aiming point. Such features as the direction of a street may be used instead of a distant aiming point.

Aiming Posts

Posts may be placed vertically in dirt-filled cans or ammunition boxes if the frontal area is covered by concrete or asphalt. Natural aiming points, such as the edges of buildings or lampposts, may also be used.

High-Explosive Ammunition

During MOUT, mortar HE fires are more heavily used than any other type of indirect fire weapon. The most common and valuable use for mortars is often harassment and interdiction fires. One of their greatest contributions is interdicting supplies, evacuation efforts, and reinforcement in the enemy rear just behind his forward defensive positions. Although mortar fires are often targeted against roads and other open areas, the natural dispersion of indirect fires will result in many hits on buildings. Leaders must use care when planning mortar fires during MOUT to minimize collateral damage.

- High-explosive ammunition gives good results when used on lightly built structures within cities, particularly the 120mm projectile. It does not perform well against reinforced concrete found in larger urban areas.
- When using HE ammunition in urban fighting, point detonating fuzes should normally be used. The use of proximity fuzes should be avoided because the nature of built-up areas will cause proximity fuzes to function prematurely. Proximity fuzes, however, are useful in attacking targets such as OPs on tops of buildings.
- During both World War II and recent Middle East conflicts, light mortar HE fires have been used extensively during MOUT to deny the use of streets, parks, and plazas to the enemy.

Other Considerations

When planning the use of mortars, commanders must consider the following:

- FOs should be positioned on tops of buildings so target acquisition and adjustments in fire can best be accomplished.

- Commanders must understand ammunition effects to correctly estimate the number of volleys needed for the specific target coverage. Also, the effects of using white or red phosphorus may create unwanted smoke screens or limit visibility which could interfere with the tactical plan.
- Mortar sections should plan to provide their own security.
- Commanders must give consideration to where, when, and how mortars are to displace in order to maintain immediate indirect fire support. Combat in built-up areas may adversely affect the ability of mortars to displace because of rubbling.

BOS Trends in MOUT

The following BOS reflect negative trends associated with CTC rotations in MOUT. Units should review these trends and use them to focus training. Focused training can assist in ensuring that soldiers are combat ready to overcome difficulties while fighting in a MOUT environment.

INTELLIGENCE BOS

- The intelligence preparation of the battlefield (IPB) is not specific enough for MOUT.
- Lack of a decision support template and timeline preparation hinder the planning process.
- There is limited intelligence focus on routes to the objective.
- The force ratio analysis is rarely done, if done at all.
- Identification of key terrain and fields of fire is not effective.
- Intelligence gathering and development of input for the planning process is not complete.
- Use of psychological operations and civil affairs operations are not planned.
- Identification of decision points and setting conditions for success are not emphasized.
- Units fail to get eyes on the objective to confirm the intelligence template.
- Little thought is given to intelligence collection from and care of civilians on the battlefield.

MANEUVER BOS

- The movement plan to the object is usually not well done.
- There is a lack of focus in the movement to the objective, resulting in significant casualties.
- Casualties in the movement prevent units from achieving mass on the objective.
- Units do not achieve mass at other decision points.
- There is a failure to isolate the objective and protect the force from counterattack.
- There is a lack of combined arms TTP for armor, aviation, and close air support for urban combat.
- Uncoordinated maneuver and overwatch are more common in the urban fight.

- An unclear doctrinal base confuses units about correct procedures for clearing rooms.
- Marksmanship at all levels is poor with the exception of some special operations units.
- There is confusion among units as how to delineate inside from outside battlespace.

FIRE SUPPORT BOS

- Use restrictive rules of engagement in dealing with collateral damage and associated urban combat effects.
- Units have problems with allocation of resources and positioning of fire support assets.
- Poor use of precision-guided munitions in units.
- Suppression of enemy air defense for assembly areas is poorly planned.
- Units poorly use counter battery fires in urban conditions.
- Q36 are not being effectively used against enemy mortars.

MOBILITY AND SURVIVABILITY BOS

- Unit movement to the objective is not well done.
- The operation orders do not properly allocate engineer resources for the urban fight.
- There is usually little unity of the engineer effort.
- Units are not effective in suppress, obscure, secure, and reduce (SOSR) at all levels.
- Engineers are attrited prior to the objective.
- Lack of eyes on the objective (scouts/aviation) prevent identification of obstacles.
- Extensive use of smoke is needed to mask movement.

COMMAND AND CONTROL BOS

- There is a lack of synchronization across the board in the battlefield operating systems.
- Units do not effectively locate their command and control nodes.
- Battalion task force is overloaded with requests from higher.
- Wargaming and course of action development for urban combat need work.
- Leaders are unsure how to effectively fight once in the city.
- Communications problems in urban conditions are a major challenge.
- Leaders at all levels have problems with rules of engagement and proportionality.
- There is poor use of the Judge Advocate General in the brigade combat teams.
- The fight needs to be defined and clear to each unit level of responsibility.
- Units fail to get eyes on the objective (scouts/aviation) to shape the battle.
- Sniper teams are not properly used in planning and not considered as additional eyes on the objective.
- Confirmation of intelligence template is denied when no one can observe the objective.

COMBAT SERVICE SUPPORT BOS

- Allocation of assets to support the urban fight is poor.
- Resupply and casualty evacuation in the urban fight are not conducted well.
- Urban-specific supply items: ladders, knee and elbow pads, and ropes with grappling hooks need to be available to all units preparing for this type of action.
- Units do not plan for urban combat and the high died-of-wounds rate.
- Speed, not haste, in the tempo of urban operations should be the norm.

AIR DEFENSE ARTILLERY BOS

- There is a poor allocation of ADA assets to support the urban fight overall.
- Focusing of the correct ADA assets at the proper place and time in the battle is poor.
- Attack aviation vulnerability in battle positions is not taken into consideration in the operations order.

SECTION IX: OPERATIONS IN A HIGH-ALTITUDE ENVIRONMENT

Soldiers deploying to Afghanistan will adapt to the conditions they may face and will perform their mission well once they understand the simple rules of soldiering at high altitudes.

What soldiers can expect while conducting high-altitude operations

Many soldiers are recreational skiers, skiing under the pristine conditions of some high glacier or mountain in Europe or in the western United States, and often experiencing the symptoms of high-altitude sickness. The headaches, the lethargic feeling, the lack of an appetite, the feeling of exhaustion, and the dehydration associated with the energy expenditure on the slopes have made many skiers call it an early day. The same skiers return the following day unaware of their increased resistance to the high altitude. This newly discovered energy is simply becoming adjusted to their new environment. In many cases, the skiers increase their energy level expenditure for each subsequent day, with growing familiarity, conditioning, and confidence in their new surroundings. The skiers are simply compensating for each day's problems by drinking a lot of fluids, eating well at night (eating in many cases way above their normal intake), and dropping into a sound and restful sleep. They emerge from their hotel the next day rested and ready to deal with the slopes and their new surroundings, having adjusted their body and mind to the conditions.

The high-altitude battlefield

The al-Qaida and Taliban forces that U.S. and coalition forces are fighting in Afghanistan have numerous factors favoring their use of high-altitude operations. The high-altitude

Afghanistan region bordering Pakistan resembles the area on the Pakistan and India border where numerous clashes have occurred between Pakistan and India. This includes battles on the Siachin Glacier, which has the distinction of being the world's highest battlefield at 19,000 feet. The Indian and Pakistani armies facing each other on this battlefield have been credited as being the foremost experts of high-altitude warfare for good reason. In operations against each other, their casualties have been high, yet the most significant factor is that 80 percent have been directly related to either cold or high altitude.

High-altitude conditions

Soldiers operating at high altitudes can expect some significant health problems that they otherwise may never encounter. With the current combat operations in Afghanistan, many soldiers, Marines, and coalition forces are soldiering in conditions that in the past were the operational environment and realm of well-trained Special Operations Forces (SOF). High-altitude operations increase energy requirements by as much as 50 percent and, coupled with cold temperatures and increased physical activity, have the potential of making soldier missions a secondary thought to surviving. The increase in physical activity may only be offset by thorough acclimatization and conditioning and equipment designed for the conditions, as well as special skills and training. These factors may have a direct impact on how a soldier performs in high-altitude conditions.

- Rugged conditioning.
- Thorough acclimatization.
- Cold weather injuries.
- Sunburn, windburn, and overexertion, creating sweat and wetness, even under cold conditions.
- Calorie intake of up to 6,000 calories per day.
- Confidence in leader's ability to deal with the altitude and conditions.

Acute mountain sickness (AMS) is a sickness that may begin at 8,000 feet above sea level. The symptoms listed below may be linked to a high rate of ascent. Many factors influence who becomes ill and who does not. A modest descent may easily reverse the following symptoms:

- Headache, and possibly some dizziness.
- Sleep disturbance.
- Fatigue.

One illness and a step up from AMS that has the potential for disrupting military operations, and one with life-threatening implications, is hypoxia. Hypoxia is high-altitude sickness in its worst form. It is a condition in which the tissues of the body are starved for oxygen. The body reacts to this loss of oxygen by increased breathing to get more air. The physical activity of the body increases the heart rate. This condition can cloud judgment. Symptoms of hypoxia include dizziness, giddiness, a tingling sensation, euphoria, blurred and/or tunnel vision, lack of muscle coordination, and a demonstrative slow reaction time. The condition affects every soldier differently depending on the soldier's age, general health, physical conditioning, and training.

The results of hypoxia can have minimal effect on an individual at 10,000 feet, but will surely increase in effects as that individual increases altitude, with a loss of consciousness and possible death above 35,000 feet. Operations above this level absolutely require an oxygen supply. The distance in altitude between 10,000 feet and 35,000 feet in operational terms is directly related to the effects of hypoxia on the soldier's ability to accomplish the mission without taking into account the other factors of mission, enemy, terrain, troops available, and time available (METT-T).

What soldiers in high-altitude conditions should and should not do

What should a soldier eat while operating at high altitudes? Remember, weight loss is a characteristic of operations at high altitude; soldiers must guard against weight loss. The average weight loss for a special forces team working with the high-altitude mountain school in 1994 was 20 to 25 pounds while living on Pakistani rations. Their schedule included 6 days of activity, 12 hours a day, but just moving around created exertion beyond the normal. The bottom line in working at this altitude is that you are going to lose weight, but you must control weight loss before it becomes incapacitating. This weigh loss leads to fatigue, loss of strength, and psychological changes, such as decreased mental capacity and alertness, along with low morale. All of these conditions can contribute to accidents and a failure to accomplish the mission.

What soldiers should eat and drink while operating at high-altitudes

- Eat a high-complex carbohydrate diet, eating portions of the complete ration verses one item or the other.
- Eat a least one hot meal a day, using whatever heat source is available (i.e., chemical heat packs in MREs).
- Eat a variety of foods and plan snacks.
- Drink 4-6 quarts of non-caffeinated beverages a day and monitor the color and volume of your urine for possible dehydration (dark yellow means take action).

What soldiers should NOT eat or drink while operating at high-altitudes

- Do not skip meals, although you will not feel like eating. Consume a little of **everything** in your ration.
- Do not eat high fat snacks or fatty foods or consume alcohol of any type.
- Do not force feed. This will result in vomiting and will make the situation much more hazardous.
- Do not drink unpurified water or melted snow that is not properly treated.
- Do not restrict water intake to save it for later, or attempt to avoid urinating.

Altitude sickness in most forms is preventable. Leaders must take precautions to protect their soldiers at moderate altitudes to avoid illness. Successful strategies to prevent altitude sickness are simple and inexpensive: spend a night at an intermediate altitude before moving higher, take it easy one day at each succeeding altitude level, drink plenty of fluids, eat a full diet, and avoid all alcohol.

Tactical considerations during high-altitude operations

Initial observations received from Afghanistan provide some interesting interpretations as to how soldiers are performing in the theater. In most cases, these observations include soldiers that have been in training already for mountainous operations, either as conventional infantry or SOF. The real test of long-term operations may depend on follow-on light infantry forces that have to this point rarely trained for this type of operation. There is still time to prepare soldiers for the rigor of high-altitude operations, but the training and equipping of these soldiers must begin now. Doctrine, Training, Leader Development, Organization, Materiel, and Soldiers (DTLOMS) provide the basis for examining these initial observations and how the Army can begin reacting to the needs of soldiers in theater. A caution must be added to any interpretation of these observations, as these operations are unique. They were made in a specified region of the world where many of these conditions may never be duplicated. Yet, the real advantage of reviewing the observations is that they are relatively concise; many offer simple and easy solutions to a problem. A few others will take some considerable effort, time, and resources to resolve.

High-altitude tactical observations

- The current ground laser designator system (GLDS) for conventional forces is too heavy and cumbersome for mountainous terrain. Precision-guided munitions are essential for this type of combat. Special Operations Forces have the system conventional forces need.
- The Canadian Army used the air-mechanized concept during decisive operations in the Afghani Mountains. The Canadian Army air assaulted small unit support vehicles (SUSV) into the mountains during offensive operations against the al-Qaida and Taliban fighters. The vehicles were used to move distances over the rough terrain at high-altitude, allowing the infantry to ride or transport their loads into battle. These vehicles allowed the infantry some small arms protection and helped them beat the fatigue associated with mountain operations. The SUSV is helicopter-transportable and provides all-terrain mobility. The vehicle performed well in combat.
- Conducting combat and maneuver at high altitudes is mentally and physically taxing. The enemy has operated at these altitudes for long periods of time and is acclimated to the thin air and familiar with the rough terrain.

- The land component does not have field artillery that would normally deploy with a unit. The only indirect fire assets within the battalion are mortars. These mortars provide fires directly in support of the battalion out to limits of the weapon's range. Beyond that range, commanders must request air support to attack targets in their operational area.
- Special operations reconnaissance teams are considered the most useful and reliable. U.S. and coalition special operations teams are deployed throughout the operational area. These teams are interacting with local forces and civilian populations, gathering information about enemy capabilities. They are also able to move undetected to suspected target sites, place them under long-term surveillance, and report their findings. When targets are vetted and approved for attack, SOF teams are able to use laser designators for direct attack.
- Fly-away packaging for force protection gear stored at a central location and designed for contingency operations is a preferred method of resupply. Units have identified the need to have technology-based force protection (FP). Units responsible for entry control points (ECP) prefer to have the following equipment available: infrared capability in lieu of night-vision goggles, sensors (at a minimum, the tactical automatic sensor system [TASS] and the wide-angled surveillance thermal imager [WSTI]), hand-held thermals, ION scanners, explosive detection scanner, vehicle-mounted thermal imager, initial enemy prisoner of war (EPW) detainee equipment, metal detector, and mirrors. This would alleviate requisitioning and initial manpower and resource drain on the unit upon entering the theater of operation.
- The traditional assault aircraft has been the Black Hawk Helicopter (UH-60). In actual operations today in Afghanistan, it is the Chinook Helicopter (CH-47). Due to the limitations of the UH-60 at high-altitudes, the CH-47 is the primary lift aircraft for air assault operations. CH-47s can quickly outpace escorting AH-64s if not paying attention. AH-64s primarily train to fly at night to take advantage of their capabilities. They are being forced, however, to fight during the day due to the limitations of the CH-47 night capability.
- Units are not associating cave clearing operations with other common training tasks. Cave clearing tactics, techniques, and procedures need to focus on basic battle drills and training already performed by units for similar tasks. Tasks for cave clearing include identifying the cave, setting a support by fire (SBF) position, employing bunker buster munitions, maneuvering the assault element into position, employing fragmentary grenades, and then clearing. Clearing caves is basically a battle drill similar to knocking out a bunker, clearing a room, and clearing a building.
- In high-altitude mountainous terrain, soldier loads can impact significantly on the endurance, mobility, and effectiveness of the soldiers and leaders. Using individual body armor (IBA) and plates at high altitudes is difficult. It is the leader’s decision when to wear and when to drop plates. When working at high altitudes, soldier load is a major leadership concern. The rucksack weighs 50 pounds, the load bearing equipment (LBE) is up to 40 pounds, then add on individual weapon. There is off-the-shelf equipment available to lighten the soldier's load that should be available to soldiers in combat.

- Operations at high altitudes greatly affect attack aviation, since aircraft do not have the lift capabilities they normally have at lower altitudes. Air assault from 8,000-10,000 feet must be conducted by the CH-47. However, the CH-47 and the AH-64 previously have not trained together. The high altitude prevents the AH-64 from maintaining a hover above escorted helicopters. The AH-64D Longbow cannot fly at the operation altitude due to the additional weight of the Longbow system dependent on aircraft weight or weather and temperature. The AH-64D radar is not relevant due to the threat.
- FM communications can be ineffective in Afghanistan due to the high altitude and operating distances. Companies and battalions are essentially operating from their headquarters. Due to the difficult terrain and modified table of organization and equipment (MTOE) fielding, units often are limited to tactical satellite (TACSAT) radios to communicate over vast distances. Units have only a single channel wide band TACSAT radio available in use. The TACSAT system is slow and requires deliberate conversation. Army bandwidth may be too narrow for effective communications.
- Ground and aviation unit commanders must understand and accept the significance that high altitude and dust have on aviation assets and aviation availability. Aviation unit operations in Afghanistan are primarily taking place at 10,500 feet above sea level (ASL). The environment drives all other considerations. The long distances require units to use "fat cow" refueling operations and forward area arming refueling point (FARP) operations that require extensive planning and preparation. Units found that maintenance was all pushed up due to the flying conditions and high operational tempo. Scheduled and phased maintenance was moved to 30 hours of operation instead of the normal 45 hours conducted at home station. The dusty conditions required full cleaning after every mission to include lube and purge.
- Difficulty in moving supplies over mountainous terrain at high altitudes required aerial resupply, with the requirement of delivering to the point of work locations. Units should treat every resupply like it is a casualty evacuation (CASEVAC). The planning provides the aircraft crew more information on how to identify the landing zone (LZ) and the surrounding tactical situation. This requires additional staff work to deploy the logistics to the work (like rations to the platoon, mortar rounds to the mortars), but the payoff is reduced expenditure of energy for those on the ground. Positioning a support platoon soldier from the supported unit on the helicopter allows the unit an opinion of when and where to drop a load over an unmarked LZ.
- Long-range observation in the mountains allowed for effective use of 60mm mortars in the direct fire mode. The open high mountain desert terrain provides excellent long-range observation to leaders and mortar crews. The company 60mm mortars in the direct fire mode successfully engaged enemy targets.

SECTION X: OPERATIONS IN COLD WEATHER

Extract from **CALL Newsletter No. 97-5,** ***Winning in the Winter***

To win in cold weather, soldiers must also overcome an additional enemy: the extreme and unforgiving cold weather environment. This means preventing and defeating cold injuries, such as hypothermia and frostbite. Cold injuries, if allowed to develop, become debilitating to the soldier (or possibly fatal, in the case of hypothermia) and threaten the unit's ability to defeat an enemy force in cold weather operations.

The four essential requirements for survival in cold environments are:

- Warmth
- Food
- Water
- Shelter

Keeping the soldier warm and nourished are essential factors in preventing cold injuries and sustaining the combat power of the fighting force. Shelter is particularly important because without it, it is difficult to provide warmth and nutrition to soldiers in a cold environment.

Heat Production

The body's three main physiological means for producing heat are metabolism, exercise, and shivering.

- **Metabolism.** Biochemical reactions which keep us alive produce heat as a by-product. Our basal metabolic rate is a constant internal furnace. However, when we are exposed to cold, wintry conditions for long periods, metabolism by itself does not produce enough heat to satisfy our body's entire heat requirements.
- **Exercise.** Exercise is an important method of heat production. Muscles, which make up 50 percent of our body weight, produce most of our heat during work. Short bursts of hard, physical effort generate tremendous amounts of heat. Moderate levels of exercise can be sustained for relatively longer periods. There are limitations, however. Physical conditioning, strength, stamina, and fuel in the form of food and water are necessary to sustain activity.
- **Shivering.** Shivering is a random, inefficient quivering of our muscles. It produces heat at a rate five times greater than our basal metabolic rate. It is our first defense against cold. Shivering occurs when temperature receptors in the skin and brain sense a decrease in body temperature and trigger the shivering response. As with work and exercise, the price of shivering is fuel. How long and how effectively we shiver is limited by the amount of carbohydrates stored in muscles and by the amount of water and oxygen available.

Heat Loss

There are five mechanisms by which our bodies lose heat. The primary means of heat loss is through the skin.

- **Conduction** is the transfer of heat through direct contact between a relatively hot and a relatively cold object. Heat moves from the warmer to the colder object. We lose heat when we lie on snow, ice, and cold or wet frozen ground (foxholes) – or sit or lean against floors and bulkheads in unheated interiors of armored, mechanized, or wheeled vehicles.
- **Convection** is the transfer of heat by the circulation or movement of relatively colder ambient environment (air or water) around the body.
- **Evaporation** is heat loss in the form of vapor. Heat is necessary to the evaporation of perspiration from the skin's surface. Evaporative heat loss accounts for 20 percent of the body's normal total heat loss. When we become overheated through physical exertion, evaporation becomes our major mechanism for heat loss. Sweating accounts for roughly two thirds of our evaporative heat loss; the remaining one third is lost through breathing.
- **Respiration** also cools the body. As a soldier breathes in cold dry air, it is warmed and humidified in the lungs. As it is exhaled, as much as 25 percent of the body's heat can be lost. Placing a wool scarf or mask over the mouth and nose warms inhaled air and assists in keeping the body warm.
- **Radiation** is the emission of heat energy in the form of particles or waves. Energy is emitted by one body, transmitted through an intervening medium, and absorbed by another body. Infrared, or heat radiation, is transferred from a relatively hot to a relatively cold object. In winter, we lose heat to the environment through radiation. We can receive radiative heat input from fires, from the sun, or from reflection off snow, water or light-colored rocks.

When exposed to the environment, the skin serves as a radiator. Unlike the rest of the body, the blood vessels in the head do not constrict and reduce the blood supply flowing to the scalp. The head is, therefore, an excellent radiator of heat, eliminating from 35 to 50 percent of our total heat production. In cold weather operations, dry insulation, especially on the head, is essential in minimizing heat loss.

The right approach to winning in the winter keeps soldiers healthy and focused on the mission. There are four basic rules to remember:

- **Keep soldiers in shape.** Cold weather clothing is heavy and presents an additional burden to a soldier's normal equipment. The additional equipment, coupled with the difficulty of trudging through the snow, causes soldiers to expend extra energy. The importance of maintaining a high level of physical conditioning cannot be overemphasized.
- **Eat to keep fit**. Regular, satisfying hot food is essential for sustained performance. Even if soldiers are not hungry, they must eat or they will lose physical conditioning. They will also lower their threshold of resistance to cold stress because their bodies will not have the fuel it needs to sustain heat production and protect against lowering of the core body temperature.
- **Drink plenty of water.** Normally, in cold climates, soldiers drink only when they are thirsty. This will not give them the water needed to avoid dehydration. Drinking plenty of water

avoids dehydration and the fatigue that comes with it. Irritability is often an early sign of dehydration. Soldiers should not eat snow as a water substitute; the moisture content of snow is relatively low, and eating it will lower the body's core temperature. Also, there is a danger of illness from bacteria. However, melted snow can be consumed after treatment with water purification tablets.

- **Maintain a positive attitude**. In cold weather operations, soldiers will face many new challenges, but none that they cannot overcome. Leadership will be reflected in soldier's attitudes and performance. Leaders must watch for early signs of cold stress in their soldiers, such as fatigue, lethargy, apathy, irritability, withdrawal, loss of dexterity or decision-making ability, decreased group cooperation, disorientation, or slurred speech.

Common Hypothermic Casualties

The preferred field management practice is to immediately evacuate the hypothermic casualty. If immediate evacuation is not possible, a unit combat lifesaver should proceed with the following measures to slow further deterioration of the hypothermic soldier's condition.

- When hypothermia is *detected in its early stage,* a soldier may respond well to the removal of the cold stress. In the absence of a serious underlying medical condition, the chances for successful rewarming are good. While we cannot change the air temperature, we can replace wet clothing with dry, protect the soldier from the wind, add layers of insulation, and apply heat. Keep in mind that a rewarmed soldier should not return to the cold until his energy and fluid reserves have been replenished. After rewarming from the early stage of hypothermia, the soldier should be given a good hot meal, several quarts of liquids, and adequate rest before returning to duty. A fatigued or dehydrated soldier is a strong candidate for another episode of hypothermia.
- During evacuation, the soldier should be insulated from the cold surfaces of a vehicle or sled. A windproof outer layer will reduce the patient's convective and evaporative heat loss. Wet clothing must be replaced with dry. If the patient is conscious and alert, he can be given warm liquids to drink (being careful not to burn him) and simple, sweetened foods to eat, including candy bars. Carbohydrates are the fuel most quickly transformed into heat and energy. However, hot liquids should not be given by mouth to a severely hypothermic soldier. If the patient is semiconscious, try to keep him awake.

Moderate Hypothermia

Symptoms: If a chilled or cold soldier does not respond immediately to basic rewarming efforts, or if he continues to exhibit symptoms of hypothermia, the soldier may be in a more advanced stage of hypothermia than initially thought, and the leader should immediately initiate action to evacuate the soldier to a medical facility.

Treatment: Move the casualty out of the wind to a sheltered environment. Replace wet clothing with dry clothing or sleeping bags. Cover the casualty with blankets or other insulating material. Apply heating pads (if available) wrapped in towels to the casualty's armpits, groin,

and abdomen. Give the casualty warm, nutritious fluids to drink. Do not give alcoholic beverages or tobacco products to the casualty. Wrap the casualty from head to toe and evacuate to a medical treatment facility in a recumbent (lying down) position.

Severe Hypothermia

Symptoms: In severe cases of hypothermia, the patient produces little or no heat and, in the absence of external heat sources, may cool further. Immediate evacuation is the preferred action for casualties suffering severe hypothermia; treatment should not be undertaken in the field. Do not delay evacuation to attempt rewarming. Rapid rewarming may lead to "rewarming shock."

Treatment: Cut away wet clothing and replace with dry clothing. Ensure that the casualty's airway remains open, but do not use an oropharyngeal airway (J-tube). Perform mouth-to-mouth resuscitation if the casualty's breathing rate drops below five respirations per minute. Apply an additional heat source. The casualty's body is not able to generate sufficient body heat and must receive warmth from another source. One method is to place the casualty in a sleeping bag with his outer clothing removed and have another soldier also remove his outer clothing and get into the sleeping bag with him. Cover both soldiers with additional clothing. The casualty's body will absorb the heat given off by the second soldier's body. Evacuate the casualty to a medical treatment facility as soon as possible. Evacuate the casualty even if you cannot detect respiration or a heartbeat. Handle the casualty gently.

Frostbite

Frostbite is the freezing or crystallization of living tissues. Exposure time can be minutes or instantaneous if skin is directly exposed to extreme cold or high winds. Heat loss occurs faster than it can be replaced by blood circulation, and is compounded by intense cold and inactivity. The extremities (fingers, toes, and ears) and face are affected first. Damp hands and feet may freeze quickly since moisture conducts heat away from the body and destroys the insulating value of clothing. The extent of frostbite depends on temperature and duration of exposure. Frostbite is one of the major nonfatal cold-weather injuries encountered in military operations. With proper clothing and equipment properly maintained and used, frostbite can be prevented. The categories of frostbite are:

- **Superficial Frostbite (mild).** This category of frostbite involves only the skin. The skin usually appears white to grayish. The surface will feel very stiff or hard, but the underlying tissue will be soft.
- **Deep Frostbite (severe).** Deep frostbite extends beyond the first layer of skin and may include the bone. Joint movement may be absent or restricted depending on the extent of the injury. Discoloration is the same as for superficial frostbite, but the underlying tissue is hard. If a large area is frostbitten, such as an entire foot or hand, tissues may appear purple as the result of sludging of blood within the vessels. (A blackened appearance will be noticed after the injury has thawed.) *This category of frostbite requires immediate evacuation to a medical facility.*

Contributing Factors:

- Dehydration.
- Below-freezing temperatures and wind chill.
- Skin contact with super-cooled metals or liquids.
- Use of caffeine, tobacco, or alcohol.
- Constriction of an extremity, which may be caused by tight boots, gloves, gaiters, watchbands, or confinement in a cramped position, may reduce blood flow and increase the likelihood of frostbite.
- Neglect.

Symptoms: Signs of frostbite vary and may include a cold feeling, pain, and burning, followed by numbness as it progresses in severity. The skin turns pale or grayish, appearing frosty or waxy white. The skin may feel hard, may not be movable over the joints and bony prominence, or may be frozen. The level of deep frostbite cannot be determined in the field. The extent of injury may not be fully realized until the frozen part has been thawed at a medical facility. It may then take three to seven days (or longer) for medical personnel to ascertain the extent of injury. Blisters, swelling, and pain may occur after thawing.

Treatment: The buddy system is one of the prime preventative measures of frostbite. Buddies must watch each other for signs of frostbite and provide mutual aid if frostbite occurs. Frostbite should be identified early – with prompt first-aid care applied to prevent further damage.

Early signs of superficial frostbite may respond to simple rewarming using skin-to-skin contact or by sheltering the body part under the clothing next to the body. However, *if tissues freeze, evacuate the victim immediately, before the frozen area begins to thaw.*

Thawing of a frostbitten victim is a medical procedure. Field thawing should not be attempted by nonmedical personnel. If the victim has frozen extremities, apply first aid, protect the frozen areas, and evacuate as a litter casualty. Give the casualty liquids and keep him comfortable during evacuation.

Move the casualty to a sheltered area. Loosen constricting clothing. Remove jewelry. Gradually warm the casualty. (If possible, have the casualty warm himself. Apply local warming by putting bare hands over the affected area of the face or putting affected hands inside the uniform under the armpits. If a casualty has a frostbitten foot, have him remove his boot and sock from affected foot, have another soldier open his clothing to expose his abdomen, have the casualty put his foot against the soldier's abdomen, and have the soldier close his clothing over his abdomen and the casualty's foot.)

- DO NOT expose the frostbitten area to extreme heat which could result in burns.
- DO NOT apply ointments or medications to the frostbitten area.
- DO NOT rub, massage, or soak the frostbitten area.
- DO NOT give alcoholic beverages or tobacco products to the casualty.
- Give the casualty something warm to drink.
- Protect the frostbitten area from cold and additional injury.
- Evacuate the casualty to a medical treatment facility as soon as possible.

Chilblain

Symptoms: Chilblain is caused by prolonged exposure of bare skin to cool or cold temperatures (50ºF [10ºC] or lower). Signs and symptoms of chilblain include acutely red, swollen, hot, tender, and/or itching skin. Open sores or bleeding lesions may result from continued exposure.

Treatment: Apply local warming (putting bare hands over the affected area on the face; putting affected hands inside the uniform under the armpits; putting bare feet against the abdomen of another soldier). Do not rub or massage the affected area. Rubbing or massaging the area may cause tissue damage. Signs and symptoms of tissue damage may be slow to appear. Apply a field dressing to lesions. Have medical personnel evaluate the casualty when practical.

Immersion Syndrome

Immersion syndrome results from prolonged exposure (hours to days) to wet conditions at temperatures from 50ºF to 32ºF. Immersion syndrome occurs when cold, wet conditions constrict blood vessels. Immersion foot, trench foot, and trench hand are types of immersion syndrome injuries. Reduced blood flow to the extremity deprives cells of needed oxygen and nutrients. Permanent muscle and nerve damage may result if this cold injury is allowed to develop. For the soldier, regular attention to his feet – drying them and changing to clean dry socks once a day, or more often if his feet get wet – is all that is needed to prevent immersion foot or trench foot.

Symptoms: The extremity appears cold, swollen, and mottled. Cyanosis, a blueness of the skin resulting from imperfectly oxygenated blood, is usually present. Tactile sensitivity is reduced, as is capillary refill time. The extrimity may look shiny. The patient may describe the affected area as feeling wooden.

Immersion syndrome usually occurs in three stages. In the first phase, the affected part is cold and without pain. There is a weak pulse at the site. In the second phase, the affected limb feels hot, as though burning, and has shooting pains. In the third phase, the casualty has pale skin, cyanosis around the nailbeds and lips, and decreased pulse strength.

When the extremity rewarms, the skin becomes warm, dry, and red. The pulse bounds and the injury is painful. The injured area may itch, tingle, and exhibit increased sensitivity to cold, possibly permanently. Recovery can last weeks. Nerve damage may be permanent. The development of blisters, ulcers, and gangrene is possible. Amputation may also be necessary.

Treatment: Dry the affected part immediately. Rewarm the affected area gradually in warm air. Do not massage the extremity. The affected area will probably become swollen, red, and hot to the touch after it has been rewarmed. Blisters may form. Remove wet clothing and replace with dry, warm clothing. Protect the casualty from injury and infection. Elevate the affected part to reduce edema (swelling). Evacuate to a medical treatment facility as soon as practical.

Snowblindness

Symptoms: Snowblindness is a temporary but often painful condition caused by inadequate eye protection when operating in brilliant sunshine reflecting off snow or light-colored rock. The eyes become bloodshot and feel irritated and "full of sand."

Treatment: The proper field management technique is to apply clean, cool, wet compresses to the eyes. The patient should then wear dark, UV-protective glasses. Aspirin can be used to control the pain. Occasionally, it may be necessary to cover the patient's eyes and lead him by the hand to an area where treatment can be administered. Recovery may take two or three days.

Sunburn

Sunburn, often associated with a summer day at the beach, can also become a debilitating cold weather injury. Both first- and second-degree burns are possible in cold weather operations.

Symptoms: First-degree burns involve reddening of the skin; second-degree burns are characterized by the formation of blisters. Mountain climbers are especially vulnerable to sunburn because they often operate at high-altitude environments covered with highly reflective snow fields. The relatively thinner air allows more of the burning rays of the sun to penetrate the atmosphere and reflect off the snow. Because the air temperature seems relatively cold, soldiers may miscalculate the intensity of the sun or simply be too weary to take preventive action.

Treatment: Sunburn usually is treated on first notice by further applications of sunburn preventive. Sun screens/blocks should be used rather than the more common cosmetic suntan preparations. In mild cases, sunburned soldiers can continue their duties even though they may suffer significant discomfort for a few days. In more severe cases, such as second-degree sunburn (with blister formation), soldiers should be treated by medical personnel who can assess the impact of their injuries on their assigned duties. If there is much swelling, cold compresses should be applied. Aspirin may be taken for pain, and warm liquids should be administered to replenish body fluids. (Salty liquids can be administered if prescribed by medical personnel. If sunburned soldiers drink salt solutions without medical monitoring, they may become nauseated and vomit, thus compounding their dehydrated state.)

Dehydration

Symptoms: In addition to irritability, other signs of dehydration include darkening urine, decreased amounts of urine being produced, dry mouth, tiredness, mental sluggishness, lack of appetite, increased or rapid heartbeat, dizziness, and even unconsciousness.

Treatment: The most important consideration is prevention. Leaders should ensure that soldiers consume four to six quarts of fluid per day. Coffee and liquids containing caffeine (tea, cocoa, soft drinks) should not be considered adequate sources for replenishing body fluids because they act as a diuretic, removing fluids from the body. Drinks containing caffeine should only be consumed in moderation – not as the primary means of hydration. *If the soldier is conscious, administer fluids by mouth. If improvement is not obvious in an hour, evacuate the*

patient to a medical facility. In advanced stages of dehydration, as in the case of an unconscious soldier, immediately evacuate the patient to a medical treatment facility.

Constipation

Symptoms: Constipation is the difficulty in passing feces caused by a deficiency in body fluids (dehydration), improper nutrition, infrequent or irregular defecation, or ignoring nature's call altogether for extended periods. Contributing factors include the unavailability of water, lack of sites protected from the elements to facilitate normal body functions, and not eating the food provided. Symptoms of constipation include loss of appetite, headache, cramping, and painful defecation.

Treatment: Treatment involves the consumption of adequate amounts and variety of foods and water (four to six quarts per day), and responding to nature's call to rid the body of waste. High-fiber foods, especially fruits, vegetables, and whole grain breads, are effective in combating constipation if accompanied by regular and adequate amounts of water. If constipation is allowed to progress beyond the self-care stage, medical treatment is necessary.

Carbon Monoxide Poisoning

Carbon monoxide poisoning occurs when oxygen in the body is replaced by carbon monoxide. For soldiers, the main contributing factor is inhalation of fumes produced by fires in areas that lack proper ventilation. Stoves and heaters in tents and running vehicle engines in which fumes leak into the cab or cargo areas are primary sources of carbon monoxide poisoning.

Symptoms: Signs and symptoms of carbon monoxide poisoning progress slowly. At the onset, they may go unnoticed because carbon monoxide is colorless, tasteless, and odorless. Many of the signs and symptoms are similar to other common illnesses: headache, tiredness, excessive yawning, confusion, followed by unconsciousness and, eventually, death. A cherry-red coloring to the tissues of the lips, mouth, and inside the eyelids occurs very late in carbon monoxide poisoning – when the patient is very near death. If this condition occurs, it may be too late to save the soldier. Action must be taken when earlier signs and symptoms appear.

Treatment: Immediately remove the victim from the source of contamination. If the soldier is not breathing on his own, administer rescue breathing. If available, give the soldier oxygen, then immediately evacuate the soldier to a medical facility. Severe complications can develop, even in casualties who appear to have recovered perfectly.

Prevention is the key. Carbon monoxide poisoning can be prevented if unit leaders enforce a few simple rules:

- Don't permit soldiers to sleep in vehicles while engines are operating.
- Ensure tent stoves and heaters are regularly serviced and inspected to confirm safe operation; ensure that sleeping tents have proper ventilation.

Tent Eye

Tent eye is caused by fumes emanating from stoves and lanterns operated in a poorly ventilated shelter. It can be prevented by using properly functioning stoves and lanterns, and adequately ventilating the shelter. First aid for tent eye is fresh air.

Leadership in Cold Weather Operations

The process of developing soldiers into cold weather fighters requires positive leadership. Leaders must understand the environmental threat and include plans for countering this threat in their operational plans or tactical standing operating procedures. Initially, the cold environment may be alarming, even frightening, to soldiers unaccustomed to operating in wintry conditions, especially when deployed to unfamiliar, remote areas. Some soldiers will find themselves confronted with challenges they have not encountered before. The cold becomes a constant reminder to the soldier of his vulnerability in the extreme environment and the likelihood of him becoming a casualty should he make a mistake. As soldiers gain experience, they develop confidence in themselves, their clothing, and their equipment, and learn they can fight and win in the winter, defeating both the cold and the enemy before them.

Aggressive, cheerful leadership is essential in helping soldiers overcome the challenges of the cold environment. To defeat the enemy, soldiers must first overcome the cold by learning how to live and survive the elements so they can focus on the enemy. Leaders must maintain a positive attitude toward the mission, their soldiers, and the equipment they have to carry out the tasks at hand.

Intense cold affects the mind as well as the body. Essential tasks take longer to perform and require more effort than in temperate climates. This should be considered when planning operations and giving orders – even for such routine tasks as vehicle maintenance and making or striking camp. There is no simple formula for the extra time required to accomplish tasks; it varies with differing conditions, state of training, and degree of acclimatization of the troops. It should not, however, be used as an excuse for overinsurance; troops readied unnecessarily early or left standing in the open after striking camp will suffer physically. Their morale will ebb – possibly at times when it should be at a high pitch.

Tips for Leaders in Cold Weather Operations

Leaders need to be aware of the symptoms that characterize a unit having difficulty coping with the cold environment. The following tips will help combat the effects of the cold when it begins to affect the minds of soldiers.

- If soldiers find it hard to remember things they have been taught, show patience; review orders and drills. Get them to think through the challenges of the environment and the mission; encourage them to ask questions. Keep their minds busy.
- Be alert for soldiers who tend to withdraw from the group's focus; keep them involved. Soldiers who withdraw into themselves should be paired in a buddy system with soldiers who are well acclimatized to the cold environment. Remind them that everyone is in the same situation, including the enemy.
- If soldiers get depressed, moody, or blue, and do not want to talk, encourage them to chat with each other. Circulate among the troops in their duty areas. Keep them talking and interacting.

- If soldiers become irritable and get on each other's nerves, keep in mind that this is likely to happen. Maintain your sense of humor and show patience. Vary their duties.
- Be aware that soldiers may tend to shirk from some tasks to keep themselves warm. Remind them that their job is to fight – that weapons and equipment must be kept in fighting order. During winter training, do not let the training become a camping trip; this is a common trap.
- Do not accept the cold as an excuse for not carrying out orders or routine tasks. It may be the reason for taking longer, but it is not a reason for letting things slide. Remember that, although the cold may make tasks more difficult to accomplish, it does not make them impossible. With knowledge, equipment, and proper training, leaders and soldiers can defeat the cold and be successful in combat.
- Plan the frequent rotation of soldiers into warming tents/areas to provide relief from the cold.
- Provide warm liquids (noncaffeine) at frequent intervals, especially when rotating soldiers into warming tents/areas.
- Plan and provide extra insulating material for individuals, when available.

The Cold Weather Clothing System

Leaders should understand the design principles of the military cold weather clothing system. These principles are:

- Insulate
- Layer
- Ventilate

Insulate: Insulation allows the creation of a microclimate around the body through which the amount of body heat lost to the environment can be regulated. By varying the amount of insulation, a soldier can regulate the amount of heat lost or retained.

Layer: Several layers of clothing provide more insulation and flexibility than one heavy garment, even if the heavy garment is as thick as the combined layers. By adding or removing layers of clothing (insulation), the soldier can regulate the amount of heat lost or retained.

Ventilate: Ventilation helps maintain a comfortable microclimate around the body, thereby helping control body temperature. By ventilating, the soldier can release excess heat and minimize sweating, which can lower body temperature later as it evaporates.

There are four ways to apply the principles in the military cold weather clothing system:

Keep it -- Clean
Avoid -- Overheating
Wear it -- Loose in layers
Keep it -- Dry

Keep clothing clean. Dirt and grease clog the air spaces in clothing and reduce the insulating effect. Dirty clothes are cold clothes.

Avoid overheating. Select the clothing needed to stay comfortable, or even a little cool. Leaders should ensure that their soldiers are not overdressed for the job they are performing.

Wear it loose. All items of the cold weather uniform are sized to allow wearing of the appropriate number of layers. This means, for example, that the field jacket may appear too large when worn without all of the layers designed to fit under it. If the uniform items do not fit loosely, the insulation will be substantially reduced.

Keep it dry. It is vital that all layers of clothing be kept dry because wet clothing conducts heat away from the body, compromising the microclimate around the body and making it difficult to regulate body temperature. Moisture soaks into clothing from two directions: from melting snow and frost that has collected on the outside of the clothing and from perspiration. Leaders should ensure that soldiers brush snow and frost from clothing before entering heated shelters or vehicles.

SECTION XI: FIELD SANITATION AND PERSONAL HYGIENE

Throughout history, disease and non-battle injuries have been the largest cause of military casualties. Personal hygiene is difficult, at best, in cold weather operations. The role of field sanitation is to aid the unit in protecting the health of troops. Field sanitation concerns itself with the basic responsibilities of:

- Personal hygiene and protective measures.
- Water supplies.
- Mess sanitation.
- Waste disposal.
- Insect and rodent control.
- Troop education.

Methods for field sanitation include the following:

- Plan for garbage/rubbish disposal by burial or incineration.
- Plan for liquid waste disposal. Use soakage pits, soakage trenches, and evaporation beds.
- Plan for body waste disposal. Use cat-hole latrine for marches, straddle trench for 1-3 day bivouac sites, deep pit latrine for temporary camps, burn-out latrines and soakage pits for urinals.
- Plan to take lime with you.
- Locate latrines at least 100 meters from the unit mess and at least 100 meters from any water source. Garbage must be buried at least 100 feet from any water source.

The following techniques and procedures can be used to maintain minimal personal hygiene in the field, especially if laundry and bath support is not readily available:

- Shave, if necessary, at night in the shelter so that facial oils stripped during shaving will be replenished overnight before the face is again exposed to the elements.
- Brush teeth daily. If a toothbrush is not available, chew the end of a twig into a make-shift brush. If a twig is not available, salt on a fingertip can suffice if applied gently.
- Change underwear as frequently as practical, at least twice weekly. Change socks as often as needed to keep the feet dry. Use foot powder as a dry rub to clean the feet.

Foot Care

- **Toenails.** Trim toenails straight across at approximately a 90-degree angle with the edges of the nails. This relieves pressure at the edges of the nails, permitting the nail to arch in the middle, so that the corners won't cut/dig into the skin below.
- **Foot Powder.** Use foot powder to dry feet. Apply powder on feet and between toes. Remove excess. Do not put foot powder in socks; extra powder may cake and hasten the onset of blisters.
- **Blisters.** Blisters can become a problem unless they are treated at the first sign of irritation, before a blister actually forms. Tape over a developing hot spot; the bandage should be sufficiently large enough so that the tape touches only nonirritated skin. Once a blister has formed, apply a doughnut-type bandage to relieve pressure on the blister. Again, the doughnut and bandage should be large enough to encircle the blister and avoid further irritation of the blistered area. Use tincture of benzoin to help the tape adhere to the skin; it also helps toughen the skin. Never lance or drain blisters unless they are surrounded by redness or they are oozing purulent material indicating infection. If this is the case, drain the blister, clean it with soap and water, and cover with a clean, dry dressing until it can be assessed by medical personnel.

Establishing Garbage Pits

- Whenever possible, dispose of all garbage in pits; burn or bury it prior to departure. There should be a pit for each platoon.
- Patrols should never leave behind any evidence of their presence in an area. All waste should be carried until it can be disposed of properly to avoid giving away potential intelligence to the enemy about patrol or campsite locations or activities.
- During training, bag all trash and garbage and haul it to the rear for disposal.

Waste management

All types of waste are generated each day in the field. Always bury your waste immediately to prevent flies from spreading germs from waste to your food. Also, burying your waste helps keep unwanted animals out of your bivouac area. If waste is not disposed of properly, the camp will quickly become an ideal breeding area for flies, rats, and other vermin. Diseases such as dysentery, typhoid, cholera, dengue, and plague could compromise the integrity of the unit. To combat this problem, unit medical personnel should provide technical assistance in the fabrication, location, and maintenance of field waste-disposal facilities. They also inspect these facilities before their initial use to ensure their proper construction and location, and then reinspect on a daily basis.

Establishing Latrines

- Normally, a central latrine should be established if dispersion within the camp is not too great. One latrine will usually serve the needs of three to four shelters or a unit of platoon size. Chemical toilets are the preferred latrine devices. An alternate facility for training exercises is the burn-out latrine. (Federal, state, local, and many host-nation laws prohibit construction of pit/straddle, trench/cross-tree latrines.)
- The latrine must be placed downwind of the campsite, but not so far from the shelters that the placement encourages individuals to break sanitary discipline. It should be wind-proofed by branches, snow blocks, ponchos, or other available materials, and should be camouflaged.
- For training, an empty MRE box, lined with a trash bag, can suffice. Full bags can be sealed, left in the box, and then hauled to the rear.

Prevent Skin Infections

Bathe frequently; take a full bath at least once every week. If showers or baths are not available, use a washcloth daily to wash:

- Your genital area.
- Your armpits.
- Your feet.
- Other areas where you sweat or that become wet, such as between thighs or (for females) under the breasts.

Potable Water

Safe potable water is essential to the Army. Water that is not properly treated can transmit such diseases as typhoid and paratyphoid fevers, bacillary dysentery, cholera, poliomyelitis, and common diarrhea. In some areas, water may also be the means of transmitting infectious hepatitis, schistosomiasis, and amoebic dysentery. Lessons from Operation DESERT SHIELD and DESERT STORM showed that units should use a planning factor of at least 7 gallons of water per soldier per 24-hour period.

Treat the individual water supply with one iodine tablet per a quart-size canteen if the water is clear, two tablets if the water is cloudy. Let stand for 5 minutes with the cap loosened, and shake to permit leakage to rinse the thread around the neck. Tighten cap and let stand for 20 minutes. Calcium hypochlorite maybe used: Add one ampule in one-half canteen cup of water, dissolve, then pour one canteen cap of the solution in the canteen, shake and let stand for 30 minutes.

The best containers for small quantities of water (5 gallons) is plastic water cans. Water in plastic cans will be good up to 72 hours, compared to metal which will only be good for 24 hours. However, you should change the water in your canteen at least every 24 hours. Water in trailers, if kept in the shade, will last up to 5 days. If the temperature outside exceeds 100°F, the temperature of your water must be monitored, and when it exceeds 92°F, it should be changed, as

bacteria will multiply. If not changed, you will end up with a case of diarrhea. Ice in containers will keep water cool. If ice is put in the water trailers, the ice in it must be removed before the trailer is moved, as the floating ice may destroy the inner protection of the trailer.

SECTION XII: UAV SUPPORT OPERATIONS

A UAV is operated without an internal pilot; instead, it is controlled from remote locations via radio frequency (RF). It provides near-real time video of the battlefield transmitted to a controlling shelter and remote video terminals (RVT). The UAV provides the commander a platform to collect near-real time video, resulting in better informed and timely decisions.

A buildup of domestic UAV configurations, promoted by the Department of Defense (DOD), occurred in the late 1980s and well into the 1990s. This occurred as DOD sought UAVs to satisfy their mission-unique surveillance requirements in either a close range, short range, or endurance category of vehicle. Close range was defined to be within 50 kilometers, short range was defined as within 200 kilometers, and endurance as anything beyond. With the advent of newer technology and with the demonstrated performance of the UAVs, the current classes or combination of these type vehicles are called the tactical UAV, followed by the endurance category.

The unmanned aerial vehicle (UAV) contributes significantly to battlefield awareness. UAV-provided information has improved the quality and timeliness of battlefield intelligence, keeping decision-makers better informed. While the primary mission of the UAV remains reconnaissance, surveillance, and target acquisition (RSTA), the UAV can be employed in support of intelligence preparation of the battlefield (IPB), situation development, battle management, battle damage assessment (BDA), rear area security, and command and control (C2). UAVs can perform many missions, which would normally be considered unacceptable or unsafe for manned aircraft. That is not to say that the UAV is an asset to be expended needlessly. METT-T will dictate when such attrition should be considered. Even then, every effort should be made to preserve the UAV because of its value as “eyes” over the battlefield.

Several autonomous UAVs have been fielded which can be given GPS-based or INS-based navigational parameters and then are left to loiter and collect SIGINT, COMINT, photography, or real-time television images, and flash the data or images back to troop commanders. Supposition is that newer, stealthy versions may even be able to be used as strategic assets, dropped by aircraft near target country borders, sneak in at low or very high altitudes, take their pictures or gather intelligence, and then sneak back out to be recovered, all without an opponent knowing anything has happened.

The UAV can support the commander in day or night operations. According to the tactical UAV concept of operations, it will fly 12 hours per day, with a surge capability of up to a maximum of 72 hours continuous if authorized by the commander. Manning will affect this as well. Surge operations come at a cost: the UAV is down for maintenance for 72 hours for maintenance following the surge.

The UAV is capable of conducting day and night operations including:

- Route, area, and zone reconnaissance.
- Surveillance of named areas of interest (NAIs).
- Support combat search and rescue (CSAR).
- Target acquisition.
- Adjust indirect fire and close air support (CAS).
- Support BDA.
- Rear area security.
- Situation development.
- Support IPB.
- Communications relay.
- Command and control.

As technology advances, the UAV will perform missions, such as mine detection, NBC detection, laser designation/targeting and weather surveillance. Other UAV systems, such as Predator, have been using Hellfire missiles in strike missions in Afghanistan. Those type capabilities will continue to grow.

Weather Limitations

The weather must be considered in developing the collection plan. If any of the following conditions are present, the mission will not launch:

- Ceilings of 6,000 feet or less will prevent collection during mission.
- Winds: Headwind of 35 knots, tailwind of 3 knots, and crosswind of 20 knots.
- Winds aloft of greater than 50 knots.
- Lightning within 10 nautical miles.
- Ice.

Command and Control

C^2 of the UAV company is strictly based upon its location in the area of operations. In the general support role, the G2 determines how the UAV will be used based on the commander's PIR. When the shelter is located at the brigade TOC, the controlling element is the brigade.

Lags in UAV targeting is a common occurrence. Whether the delay is a lack of communication, lack of situational awareness, or a lag in the dissemination of the intelligence, the fact remains that good intelligence is not being used to its fullest potential. The brigade requires imagery analysts to allow instant analysis of UAV imagery, or if better imagery training were provided to the other imagery MOS and identification added to their job descriptions, then the possibility of someone being available to exploit imagery at the brigade level would be greatly increased. Better communications between brigade, fire support, the UAV, and whomever is exploiting the imagery will further decrease the lag time.

UAV Employment Concept

The UAV system should be used during the first critical days of a conflict. That is when air defenses are most numerous and aircrews most vulnerable to these defenses because of inexperience in combat. High losses of UAVs are much more acceptable than those of aircrews and their airplanes.

When used, UAVs should generally perform missions characterized by the three "Ds": dull, dirty, and dangerous. Dull means long-endurance missions which, in the future, could continue for several days. Dirty means jobs, such as detecting chemical agents and their intensity; certainly a mission to avoid if possible. Dangerous missions for unmanned vehicles are numerous and growing. Two that come to mind, however, are reconnaissance deep behind enemy lines and suppression of enemy air defenses.

SECTION XIII: FOOD AND WATER

Food and Waterborne Diseases

Sanitation is extremely poor throughout the country, including major urban areas. Local food and water sources, including ice, are heavily contaminated with pathogenic bacteria, parasites, and viruses to which most U.S. service members have little or no natural immunity. If local food, water, or ice from unapproved sources is consumed, diarrheal diseases can be expected to temporarily incapacitate a very high percentage of personnel within days. Hepatitis A, typhoid fever, and hepatitis E are common among the local population; these diseases can cause prolonged illness in a smaller percentage of U.S. personnel exposed to contaminated food or water sources. In addition, large cholera outbreaks occur among the local population annually and could pose a risk to U.S. personnel.

A. Food

High-risk food items, such as fresh eggs, unpasteurized dairy products, lettuce or other uncooked vegetables, and raw or undercooked meats, should be avoided unless they are from U.S. military approved sources. Those who must consume unapproved foods should choose low-risk foods, such as bread and other baked goods, fruits that have thick peels (washed with safe water), and boiled foods such as rice and vegetables.

The availability of food varies widely within regions and between regions. Food sources (both plants and wildlife) are most abundant where two biological regions meet, such as a beach, river, or stream bank; the edge of a marsh; or a cleared area in a forest.

1. Availability

In forests, there is likely to be little vegetation on the forest floor; consequently, few animals and little food can be found there. The best potential areas to locate food are stream banks and clearings.

In marshes and swamps, extensive natural foods are available. Plant life includes water lilies and cattails, while edible animal life includes turtles, snakes, and fish. Unfortunately, some snakes are poisonous, so approach them with care and kill them from a distance by pinning their head down with a forked stick and crushing their head with a rock or cutting it off. Be aware that snakes can strike from a distance equal to a considerable portion of their body length (the distance varies with the snake), and can strike more quickly if coiled. After procurement, discard the head with care (bury it). Prepare and eat snakes like other small game.

In agricultural areas, the availability of food varies according to the type of farming. In areas of commercial-type agriculture (such as plantations) there may be little food available, especially during non-growing seasons, because plantations will concentrate on one crop. Considerable food may be found in subsistence farming areas, including grain, vegetables, and domestic animals. However, farms may have dogs or fowl, which can be expected to react with alarm to the approach of a stranger.

In desert areas, little food is likely to be available. One of the few available animals may be snakes.

2. Food Considerations

Food can dehydrate and kill if there isn't sufficient water in the body for sweat and digestion. The body will give priority to food digestion by robbing the rest of the system of needed moisture. A soldier should eat only if he can find enough water to replenish his supply regularly. If there is a choice of types of food, eat carbohydrates; they use the least amount of water to digest. Fats and proteins use the most. Military emergency rations are mostly carbohydrates for this reason.

A soldier finding plant or animal food in the desert should not pass it by if it is easily obtainable. Food is normally hard to come by, but it is very easy to prepare/preserve in the desert. It can usually be saved until water is found. Meat or fruit can easily be cut into strips, wrapped in cloth to protect it from insects and sand, and laid on top of, or just under, the hot desert surface. This process preserves the food, kills any parasites, and makes it more palatable. No cooking is necessary.

Plants and animals are normally found near water. Soldiers finding one of these should be aware that the other is probably near. Animals are not visible at dusk and dawn. If animals are seen in the heat of the day, be alert. Enemy activity or other intruders may have pushed them from hiding.

Attempting to steal food from native villages or camps is difficult. Desert dwellers often have dogs and are likely to be active at night and sleep in the heat of the day. Food is a valuable commodity to poor people, especially in time of war, and is very likely safeguarded against theft. In many desert cultures, all males between puberty and senility carry weapons as a sign of manhood. “Law” may be dispensed rapidly on the spot. This is especially true of isolated mountain people or nomads.

B. Water

Lakes, rivers, streams, or other surface water in rural areas may be contaminated with leptospirosis. Regionally, large leptospirosis outbreaks have been reported, associated with contact with contaminated water sources. Operations or activities that involve extensive water contact may result in personnel being temporarily debilitated with leptospirosis. If unapproved water, as found in many lakes, rivers, streams, and city water supplies, must be used in an emergency, the water may be disinfected by:

- Adding calcium hypochlorite at 5.0 ppm for 30 minutes.
- Adding Chlor-Floc or iodine tablets according to label instructions.
- Heating water to a rolling boil for 5 to 10 minutes.
- Adding 2 to 4 drops of ordinary chlorine bleach per quart of water and waiting 30 minutes before using it.

Either U.S. military preventive medicine or veterinary personnel should inspect bottled water supplies. Bottled water does not guarantee purity; direct sunlight on bottled water supplies may promote bacterial growth. Water in canals, lakes, rivers, and streams is likely to be contaminated; unnecessary bathing, swimming, and wading should be avoided. If the tactical situation requires entering bodies of water, all exposed skin should be covered to protect from parasites. Following exposure, it is important to dry vigorously and change clothing.

Water will determine how long a soldier can survive in the desert, and its usage must be a consideration in every decision made. All life/activity in the desert is linked to the amount of water available, and needs vary according to temperature and the amount of exertion. Soldiers should procure and consume as much water as possible, at every opportunity.

Conserve body moisture by:

- Doing any heavy labor slowly or in the cooler hours– before 1000 and after 1800. **AVOID OVERHEATING.**
- Staying still in the shade and out of the wind when it is hot.
- Keeping clothing on and closed to trap the sweat next to the skin and prevent sunburn. Wear clothing loose and in layers. If necessary, improvise additional layers of clothing using whatever is available.
- Keeping the mouth closed. Breathe through the nose. You lose one pint of water per day through normal breathing. A cloth across the mouth and nose will reduce respiration water loss.
- Soaking clothes with undrinkable water (if it won't cause a chemical burn).
- Reducing eating if water is not available.
- Refraining from smoking - tobacco dries out the mouth.

1. Locating Surface Water

Locating water in desert areas requires keen observation. Surface water is usually found after rare rainstorms in the form of intermittent streams and pools of water or water-filled cracks

in rocks. Water may take a few weeks to a couple of months to dry up. By looking for logical water collection area indicators, soldiers might be able to locate a surface source.

- Lush green or flowering plants indicate recent rainfall in the area. Look in low spots between hills or dunes and at the base of cliffs. Rocky places may hold large pools for a long time, especially under overhangs or in cracks in the rock. Pools of water may be standing in dry stream beds.
- Fog in the morning could be another indicator of recent rain.
- Signs of animals indicate the presence of water.
- The "v" formed by the intersection of two animal trails usually points toward water.
- Flight direction of birds at dusk and dawn can indicate water.
- Large quantities of bird dung at the surface of a crack in a rock may mean water in the crack.
- The sound of frogs at night can guide a soldier to water.
- The presence of bees and/or other insects may indicate water is nearby.
- Brush piles in low spots are sometimes used by local people to slow evaporation and keep animals out of pools of water.
- Another surface source of water can be dew. If dew is heavy, tie cotton rags, clothing, or bandages to the ankles and walk through the low brush and grass. When the rags become soaked, wring them out into a container.
- Shallow lakes have not been mentioned due to the great possibility that such bodies of water will be contaminated with salt, alkali, magnesium, or sulfur. If swallowed, these could act as dehydrating agent, laxative, or poison. To use water from this source, filter it with the Survival-06-Manual Reverse Osmosis Water Pump (FSN 4610-01-313-6085). This device is capable of filtering salts, alkali, sulfur, metals, bacteria, and viruses suspended in water sources. The pump can provide up to six gallons of fresh drinking water per day from otherwise unusable sources. (If equipped with this pump, the unit's evasion plan of action development, survival on the ground, and recovery should take this capability into consideration.)

2. The sun may be used along with plastic to obtain water.

Vegetation bag: This is a large plastic bag in which cut vegetation is placed. The bag is then tied shut and left in the sun. This is the preferred method for soldiers: A vegetation bag can be left on the ground or in a sunny hole in the ground, where the risks of it being noticed are reduced.

Transpiration bag: This is a plastic bag placed over the leafy portion of a branch and then tied. During the hottest part of the day, the plant emits water, which is trapped and condensed in the bag. This is not a preferred method to be used in an evasion situation, since there is a risk the bags will be noticed.

Solar still: This is the least preferable choice, and should be used only in a survival situation, and only if expected to be in the area for more than one day. The effort to construct this device will expend more water than it produces on the first day.

3. Ground (Subsurface) Water

Springs and underground rivers sometimes come to the surface and then disappear into the desert. These areas are usually inhabited oases. The depth of subsurface water can vary widely; it may be just under the surface or over 100 feet deep. Water near the surface might by obtainable by digging in likely spots such as:

- Areas with mud or moist sand (mud can be wrapped in cloth and wrung out).
- The lowest spot between hills or dunes.
- Low spots at the base of cliffs or in narrow rock valleys.
- Low spots at the outside curve of a dry stream bed.
- Low spots with rich, green vegetation (places where animals have scratched at the surface or flies hover over the ground).

Man-made structures, such as wells, cisterns, and Karez (irrigation tunnels) are another potential source of water.

Wells are the major source of water to desert people. They may be 10 to over 100 feet deep. Well users bring their own rope and bucket. These wells are usually located in low places, such as dry rivers, valleys, or at the base of dunes or cliffs.

Cisterns catch and hold water from intermittent streams or run-off from storms. Soldiers encountering ruins can look for old irrigation ditches and follow them uphill from flat places that might have been planted fields at one time. Cisterns are likely to be at the bottom of a dry river bed or canyon and are usually nothing more than brick or rock-lined storage tanks.

All of these manmade subsurface water sources require a long line and some form of bucket to get to the water. Wells in the desert are usually found along trails and can be from 20-30 miles apart. Permanent camps may be 2-3 miles from wells, although nomads sometimes camp very close to a well. Watch for worn paths leading away from camp areas; they may lead to a well. Look for old wells uphill from abandoned homes, farms, or other dwellings. If animal dung and remains of old campfires are noticed, there may be a well nearby. Some people stack animal dung near the wells to dry for use as fuel at a later date.

Well openings may be covered to prevent sand and debris from filling them in. Look for doughnut-shaped mounds, brush, or sand-filled depressions. They may have to be dug out. Be careful not to allow sand or debris to fall down the hole; the water may be very shallow in the bottom of the well.

Finding water is not the only problem facing soldiers. Once found, it must be obtained without being detected. Scout the area and observe the well from a distance. If the enemy knows a soldier is in the area, they may try setting in an ambush at the well. They know the soldier needs water! Look carefully for vehicle tracks; carefully scan any high ground for enemy observers or dust. A water source should be approached during darkness when escape chances are increased if the enemy has set a trap.

When a soldier uses a well, he should get as much water as he can carry and move away from the area as soon as possible. The volume of water carried governs the soldier's range of travel and ability to hide for a length of time if the enemy is near. Further, the next water source

may be dried up or inaccessible. Fill all water bags, canteens, and any improvised containers to hold water, such as a poncho, plastic bag lining a rucksack or survival kit container, a condom in a helmet, or pneumatic life preserver bladders. Both the approach and departure from the well should be evasive from one point of concealment to the next. If in a group, post a lookout. Tracks should be brushed out when leaving.

All water should be considered biologically contaminated. If water purification tablets are available, use them. Dysentery and other waterborne diseases can cause severe dehydration. Filtering and aeration might improve the taste and appearance of water. If no purification tablets are available, a soldier still needs the water to live. If boiling is not an option (the smoke, flame, and odor from a fire are very risky in open terrain), clean the water as much as possible by other methods. Allow sediments to settle, then filter the water through cloth, sand, and/or charcoal. Fully aerate (pour the water from one container to another or shake up with top open). Allow contact with direct sunlight.

Water containers need care. Protect them from thorns, grit, abrasions, or sharp rocks, and try to keep them in the shade. Place them where they will not be damaged or destroyed. Protect water and containers from freezing on winter nights, when expanding ice may burst the containers. Keep them close to the body. Be sure rodents cannot gnaw on them.

SECTION XIV: REACTION TO CIVIL DISTURBANCE

Operational Vignette: An Inter-Entity Boundary Line (IEBL) crossing by the FWF from Maglaj to the village of Rijecca in the Doboj municipality was coordinated through the mayors of Maglaj and Doboj. The purpose of the crossing was to visit a cemetery. It was agreed that the visit would take place, and another Chief of Police guaranteed the safety of the faction visitors. Coordination by both TFE and NORPOL staffs ensured that the conditions were set to minimize the possibility of a confrontation between the two FWFs. These actions included: positioning of checkpoints along the route to monitor movement and to ensure weapons were not brought into the ZOS; helicopters on standby; and QRFs postured to respond, if necessary. In addition, the IPTF and UNHCR would accompany the visiting factions' personnel throughout the visitation. When the visitors reached the IEBL, an FWF police force handed the group over to another FWF police force who escorted them to the cemetery. A crowd of 15 other faction personnel were at the site. Four of the other faction individuals instigated an altercation with journalists who were with the visitors. One of the faction individuals fired two shots in the air; the FWF police subdued him and confiscated the weapon. The incident was reported by the IPTF to the TFE TOC. As a result, the DANBN QRF was positioned two kilometers north of the site, a tactical PSYOP team moved to link up with the QRF, a OH58C flew to the location, and the TFE QRF with combat camera crew were put on a 30-minute alert. The OH58C confirmed that FWFs were at the site. The visit resumed, but was later suspended because of rock throwing and increased tension. The FWF police escorted the visitors back to the appropriate side of the faction IEBL.

- Because of prior coordination by the staff ensuring the involvement of the mayors, both factional police, the IPTF, and the UNHCR, the situation was resolved by the civil authorities rather than the soldiers.
- The staff also synchronized a branch plan to introduce forces if the situation could not be resolved by the civil authorities.
- Generally, good reporting by the IPTF and NORDPOL allowed the battle captain to track the battle and provide updates to the commander and staff. This facilitated the rapid buildup of combat power once the shooting incident occurred.
- The OH58C, with observer, served as a redundant means to confirm or deny reporting.

SECTION XV: BASE CAMP OPERATIONS

Base Defense Techniques

The common tasks associated with successful base defense operations include:

- Establishing the base defense coordination net.
- Passing indications and warning (I&W) to unit TOCs on the base.
- Raising force protection levels for all soldiers on base.
- Activating and manning all perimeter supplemental positions.
- Reacting to/stopping perimeter breach by armed personnel.
- Reacting to car bomb incident.
- Reacting to attack from indirect fire or air attack. Activating the bunker occupation plan.
- Reacting to/evacuating a casualty.

Actions for base defense should be clearly outlined in the base defense SOP. The base defense SOP should be disseminated down to the soldier level ensuring that every soldier understands his part in the base defense plan. Base defense exercises should be conducted regularly to ensure compliance with the SOP. It is too late to discover a flaw in the base defense plan when an actual attack occurs. Units should consider the following when creating or updating base defense SOPs:

Force Protection Levels

- A systematic approach needs to be established to alert all units on a base about the increase in the force protection level. Often, isolated units and civilian/government organizations are overlooked.
- Soldiers need to ensure that protective equipment, such as body armor and protective mask, is readily available. Many soldiers do not bring this equipment to their daily assigned positions. In the event of an increase in the force protection level, these soldiers would have to leave their place of duty to retrieve their equipment, disrupting daily operations at a critical time.

Bunkers

- Engineers should routinely inspect bunkers to ensure that they are safe to occupy.
- Units that maintain bunkers should ensure that a plan exists to provide light, heat, food, and water for the bunker. In the event that bunkers are occupied for extended periods, these life support items are essential.
- When a bunker occupation plan is activated, each bunker must have a type of communication means to ensure that soldiers remain informed of the situation. Either a landline or an FM radio will work.

Alarms

- Alarms, such as sirens, need to be tested routinely. Alarms should be heard throughout all areas of the base. Supplemental alarms, such as vehicle horns, may need to be used to reach isolated areas of a base.
- Different alarms can be used to distinguish between different types of attacks. One type of alarm can signify an air/mortar/artillery attack and a different type of alarm can signify a ground attack. Different actions may be required of soldiers for these two types of attacks.

New/Transient Soldiers and Visitors

- Units should ensure that new soldiers are briefed on force protection levels on the first day they arrive in theater. Units should also provide guidance to newly arrived soldiers on actions to take in the event of an attack on the base.
- Soldiers in transit and visitors may be at a base when it is attacked. These soldiers will not be aware of the actions that are required of them in the event of an attack. It is the responsibility of all soldiers to assist and provide guidance to these visitors who are not familiar with the base SOPs.

Civilians/Local Nationals on Base

- There may be many local nationals on base doing various jobs. These local nationals need to be accounted for, ensuring their safety from attack. The safety of soldiers should be considered in the event that some of these local nationals decide to participate in the attack.

Perimeter Security

There were 51 incidents of unauthorized personnel attempting to penetrate the perimeter of base camps -- 24 were successful. The perpetrators were frequently being identified and detained prior to entering the base camp. This is mostly due to the increased vigilance and situational awareness of guards and patrols in the base camps. The G2 analyzed the incidents, distinguishing no clear trends. However, the geographic concentration of the incidents correlate with local populace needs (trying to acquire foodstuffs) and existing targets of opportunity (if security does not appear to be maintained). Most of the intruders were teenagers. There were no indications of a prospective threat from organized or terrorist elements.

- Varying the patterns or activities of base camp security helps avoid routines and reduces the possibility of being targeted.
- Effective base camp security measures is the best precaution to deter prospective intruders from attempting a base camp penetration.
- Constant assessment and re-evaluation of incidents and reporting from units and convoys assist the S2/G2 in identifying trends and analyzing the tactics and techniques of perpetrators.
- Proactive CID programs are the cornerstone to a thorough investigation of incidents, and civil affairs campaigns assist in identifying community needs and the dissemination of information.

Alert Procedures

- In one unit, it was discovered that notification of the alert was spread largely by word of mouth.
- There needs to be a combination of signals, both visual and audio.
- One unit used a visual signal (star clusters) to alert personnel in base camps. Another unit used a combination of a star cluster for visual and two audio signals – a "Triangle Warning" and three short blasts from a whistle. This unit also used a "runner" and a PA system to issue instructions.

Civilians Inside the Base Camps

- There are many civilians inside the wire at any given time. These civilians include local nationals and IFOR-employed civilians from other countries.
- There needs to be a combination of signals, both visual and audio. Civilians need to be accounted for and secured at a protected location. A decision must be made whether the situation permits the local civilians to be escorted outside the wire. Regardless, local civilians should not be allowed to use the phones to call home.

Command and Control of the Perimeter Defense

- One unit positioned the HHC commander, who was tasked to command and control the perimeter defense, inside the TOC. The TOC was cramped due to the excess number of people.
- Another location needs to be designated for command and control of the perimeter defense other than the TOC. This location needs to have ample space for excess personnel and good communications.

SECTION XVI: CONVOY OPERATIONS

During a convoy, a vehicle broke down. The convoy did not have the necessary equipment to conduct self-recovery to tow the inoperable vehicle. The convoy commander decided to leave the vehicle with the driver and TC, while the remainder of the convoy (three vehicles) moved to the closest base camp to get assistance. Ultimately, the vehicle and personnel were left at the location overnight. The next day the vehicle was recovered without incident. The purpose of the four-vehicle convoy is to facilitate force protection, deterring ambush and kidnapping. Additionally, the four-vehicle rule provides convoy commanders flexibility. The convoy commander can cross-load personnel from an inoperable vehicle if self-recovery cannot be performed. Another alternative is to leave a vehicle with the element while the remainder of the convoy seeks assistance. Only under the most extreme circumstances should soldiers and a single vehicle be left alone.

Vehicle Breakdown Procedures During Convoy Operations

Units constantly have convoys on the road, to the point that it seems routine. However, the reality of movement should be anything but routine. Convoys may hit a mine, get lost, lose communications, have an accident, or any number of other unpleasant events.

Actions for vehicle breakdowns during convoys must be wargamed and incorporated in unit standing operating procedures. Units should approach vehicle breakdown procedures as a battle drill with actions being executed sequentially. Units should consider the following actions:

- **Step 1:** Establish communications, notifying the unit's higher headquarters that a vehicle in the convoy has broken down.
- **Step 2:** Attempt self-recovery. This step infers that the convoy has the appropriate equipment to execute the task. Pre-convoy inspections should ensure that self-recovery equipment is available and serviceable.
- **Step 3:** If self-recovery cannot be performed, leave a vehicle with the inoperable vehicle. Before departing, the convoy commander should render a "five-point contingency plan" outlining what actions to take in specific instances (e.g., attack).
- **Step 4:** If steps 2 and 3 are not appropriate, cross-load personnel and move to the closest base camp.

Convoy commanders should ensure that soldiers do not become complacent about convoy operations. Before each convoy, brief the following actions to all members of the convoy:

- Actions at breakdowns.
- MEDEVAC procedures.
- Routes, checkpoints and rally points.
- Minestrike procedures/locations of known minefields.
- Actions on contact.
- Actions to take if there is a break in contact.

Units should develop and drill "lost communications" actions. Both the convoy and the unit must have an established drill to regain communications, especially if the convoy is overdue. On one occasion, a convoy was overdue, and the BDE had to send out helicopters and the QRF to regain communication.

Leaders must ensure that soldiers understand and are prepared for the dangers they may encounter when conducting convoys. Special care should be taken to prevent complacency on safety, communications, and readiness issues.

CHAPTER III: An Introduction to Afghanistan

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SECTION I: LOCATION AND DESCRIPTION

Lying more than 482 kilometers (300 miles) from the sea, Afghanistan is a barren, mostly mountainous country of about 647,500 square kilometers (250,000 square miles). It is bordered by Turkmenistan, Uzbekistan, and Tajikistan to the north, Pakistan to the east and south, and Iran to the west. Including a long, narrow panhandle (the Wakhan Corridor) in the northeast, Afghanistan has a northeast-southwest extent of about 11,450 kilometers (900 miles), and a northwest-southeast extent of about 804 kilometers (500 miles). With peaks up to about 7315 meters (24,000 feet), the Hindu Kush forms the spine of the country, trending southwestward from the Pamir Knot to the central Afghan province of Bamian. Subsidiary ranges continue to the south and the west with decreasing elevations, gradually merging into the plains that continue into Iran and Pakistan. A broad plateau stretches from north of the Hindu Kush to the Amu Darya River and eventually to the Russian steppes. In the east, the mountains are indistinguishable from those of Pakistan. Afghanistan is approximately the size of Texas.

SECTION II: TOPOGRAPHY

About one-third of Afghanistan, in the southwest and north, is arid plain. The southwestern plain is the larger of the two and is a barren desert with large areas of drifting sand, scattered hill belts, and a few low mountains. Small villages along a few intermittent streams, small settlements, and a narrow band of cultivation along the Helmand River are the only features that break desolation. The Helmand is one of the few perennial streams in the region. The northern plains are actually steppes with seasonal grasslands supporting a small nomadic population. Permanent settlements are located along the margin of the steppes and on the flood plain of the Amu Darya River.

The mountains that comprise the other two-thirds of the country are the perennially snow-capped Hindu Kush in the northeast and progressively lower mountains in the west. The Hindu Kush have sharp-crested ridges and towering peaks, while the lower, western mountains are generally rounded or flat-topped. Afghanistan can be broken down into three military operational zones: the Northern Steppe, the Afghan Highlands, and the Southwestern Desert Basins.

SECTION III: DRAINAGE

Afghanistan has four major river systems that originate in the Hindu Kush: the Kabul, the Helmand, the Amu Darya, and the Harirud. Of the four, only the eastward flowing Kabul ever reaches the ocean; the other three eventually disappear into salt marshes or desert wastes. Only the Amu Darya (also known as the Oxus) has significant navigable reaches. The rest are fordable for the greater part of the year throughout their courses. The Amu Darya also serves as the northern border of Afghanistan. The Helmand is the largest in flow and volume and runs southward into across the southern desert into the salt marsh wastes found along the Afghan-Iranian border. The Harirud runs westward past Herat then turns northward, forming the border between Afghanistan and Iran.

All the Afghan rivers and their tributaries are used for irrigation. Supplementing the stream irrigation is the karez, a system of underground channels (with vertical access and maintenance shafts) carrying water from the base of the mountain slopes to oases on valley floors. The signature of karez (qanat in Iran), particularly noticeable from the air, is the row of evenly spaced

openings (shafts) surrounded by mounds of earth that define the course of the underground channels.

SECTION IV: VEGETATION

What little natural vegetation there is in Afghanistan consists mainly of bunch grasses; trees are scarce and mostly limited to planted poplars and willows around settlements. Because of infertile soils and centuries of seeking fuel and forage, even scrub and brush are difficult to find. Timber is mostly absent. Any timber laying around the ground or attached to buildings in deserted villages should be suspect for booby traps. Timber is very scarce and villagers will booby trap their homes to prevent theft and pilferage.

Irrigated areas produce wheat, barley, corn, and rice, as well as sugar beets, melons, grapes, cotton almonds, and deciduous fruits. The two primary Afghan cash crops are opium poppy and cannabis. Afghanistan is the major opium supplier for the European heroin market.

SECTION V: CLIMATE

Marked seasonal extremes of temperature and scarcity of precipitation characterize Afghanistan's climate. Topographic features strongly influence all elements of the climate. Winters (December through February) are dominated by constantly changing air masses associated with passing migratory lows and frontal systems. Winters are cold, with nighttime temperatures below freezing common in low elevations and frequent winter snows at higher elevations. To the south and southeast the low-level temperatures are less severe. Winter snows are frequent at the higher elevations and there are permanent snowfields in the Hindu Kush. Summers (June through August) are continuously sunny, dry, and severely hot; however, intrusions of moist, southerly monsoon air occasionally bring rain, increased humidity, and cloudiness to the extreme eastern portions. At elevations below 1,220 meters (about 4,000 feet) temperatures rise to over 38°C (100°F) on a daily basis. Very low humidity is normal during the summer. In the other seasons, relative humidity is high in the early morning and moderate in the afternoon over most sections. In most of Afghanistan, winter and spring are the cloudiest periods, and clear skies are common in summer.

Precipitation is scarce, with desert conditions prevailing in the southwestern and northern plains. What annual precipitation there is falls mostly in the winter and spring; summers are almost uniformly rainless. Thunderstorms are most frequent during the spring, but also occur during summer in extreme eastern portions of the country. Flash floods sometimes result from severe thundershowers. Long droughts are not uncommon.

SECTION VI: THE ECONOMY

Afghanistan is one of the world's poorest and least developed countries. The geographical location of Afghanistan contributes to many of its features: abundance of natural resources such as natural gas, petroleum, coal, copper, and precious and semiprecious stones; varied but landlocked topography with mostly rugged mountains, especially in the northeast, and plains in the north and southwest; earthquakes and flooding; ethnic diversity; and a variety of languages.

The Taliban, preoccupied by its determination to defeat the Northern Alliance, did little to rebuild Afghanistan, which has been in economic disarray since the end of Soviet occupation in 1989. Two decades of war and grinding poverty have left Afghanistan in disrepair: Warfare has

destroyed roads, bridges, and canals, while looting and shortages of spare parts has shut down power plants, factories, and telephone systems. Afghanistan has some of the worst social indicators in the world: the highest rates of illiteracy; mother, child, and infant mortality; malnutrition; and ratio of widows and orphans in the population. These combine to produce one of the lowest life expectancies on the globe. The bleak situation has prompted foreign aid efforts, such as the UN World Food Program, which provides assistance during periods of drought.

SECTION VII: POPULATION FIGURES AND DISTRIBUTION

Afghanistan's population, estimated at 26,813,057 (U.S. Census Bureau, 2001) is characterized by high growth, low quality of life, and an unusual settlement pattern brought on by conflict and drought. The country is extremely young, with 42 percent of the population under the age of 15. Life expectancy is under 40 years, reflecting the overwhelmingly poor living conditions throughout the country. The majority of the people (about 60 percent) live in rural areas, about 30 percent live in cities, and 10 percent live a nomadic lifestyle. These percentages are rough estimates, however, because the ongoing civil war and a succession of poor growing seasons have forced over 3 million Afghanis to become refugees. Between 600,000 and 800,000 people were internally displaced as of the end of 2000, according to the UN Office for the Coordination of Humanitarian Affairs. The UN High Commissioner for Refugees estimates that 2.5 million Afghanis have migrated out of the country.

SECTION VIII: ETHNICITY AND LANGUAGE

Afghanistan is a complex mosaic of ethnolinguistic groups. The dominant group, politically and in terms of numbers, has been the Pashtun, who consider themselves the "true" Afghani people. Pashtuns are Sunni Moslems, tribally organized, speak Pashtun, and comprise between 35 and 50 percent of the population. The Pashtun live primarily in the south and east areas of Afghanistan, which include the cities of Kandahar and Kabul, respectively. Throughout Afghanistan's history, tribal rivalries have characterized the Pashtun people, but tribes have tended to put aside such differences when faced by a common enemy, such as the British in the 19th century and the Soviets in 1979.

The Tajiks are the principal ethnic group of Afghanistan's northeast. Tajiks comprise about 25 to 30 percent of the population and are defined as Sunni Moslems who speak Dari, a derivative of Farsi. Animosity between the Tajiks and Pashtuns has been a hallmark of internal politics since the British were driven out in the 19th century.

The Hazaras, who make up about 15 percent of the population, are concentrated primarily in the center of the country. Hazaras are characterized by Mongoloid features and practice the Shia variety of Islam. Historically, the lowest group on the Afghan social ladder, the Hazaras have endured discrimination and poor living conditions for centuries. Most are engaged in agricultural activities.

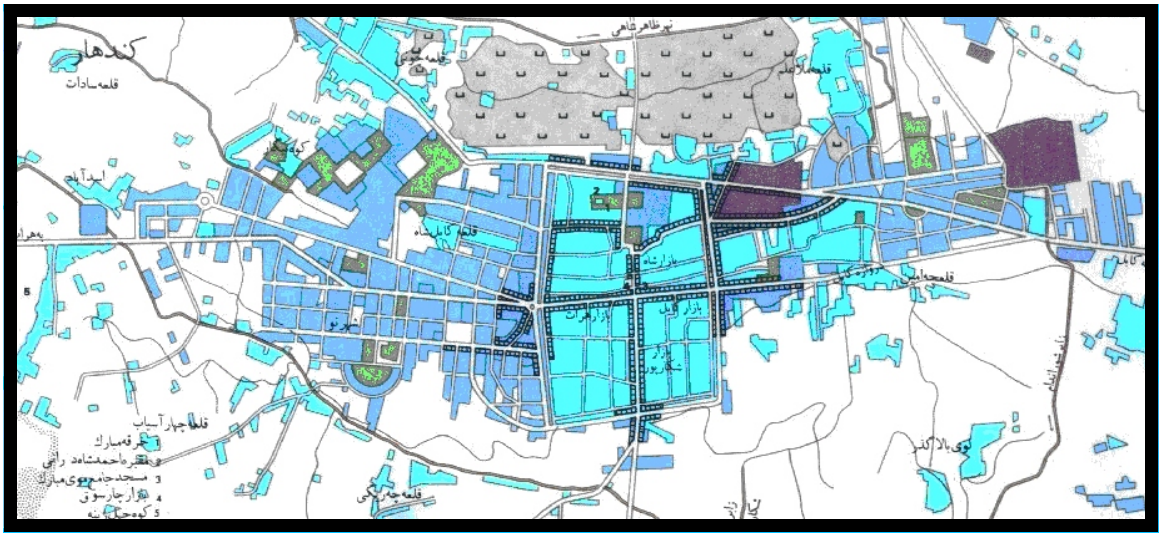
The final large ethnic group in Afghanistan are the Uzbeks, whose numbers have diminished in recent years as many have migrated to Uzbekistan. Located primarily in the north-central section of the country, the Uzbeks speak Uzbeki and comprise about 10 percent of the national population.

SECTION IX: RELIGION

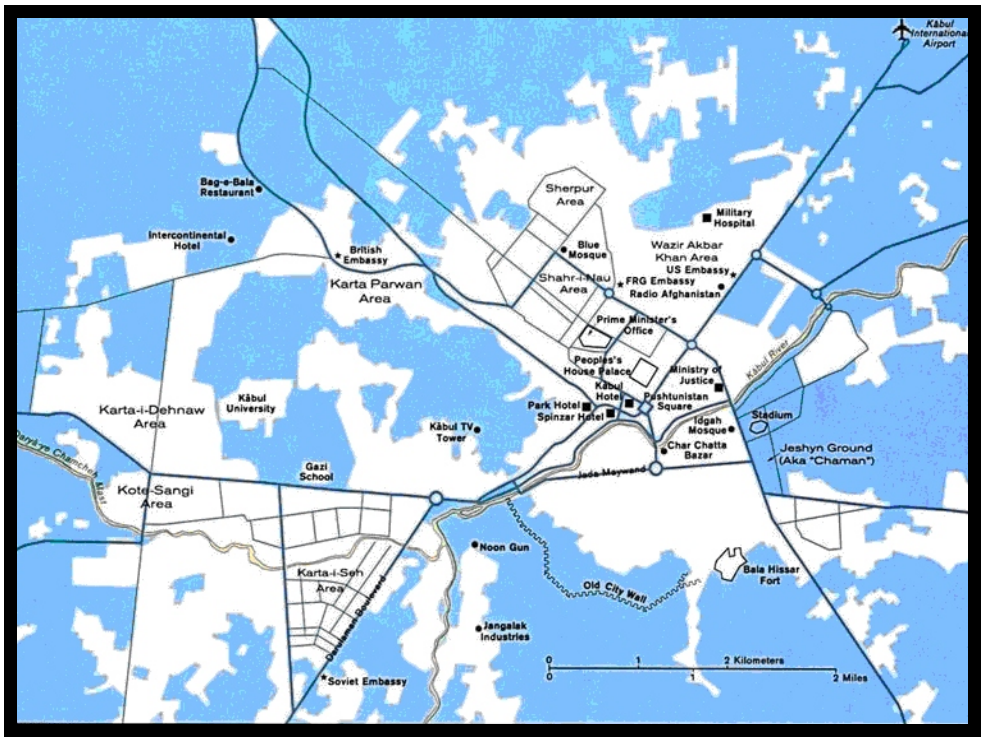
As of 1979, 99.7 percent of the Afghan population was of the Moslem faith, and the remainder was largely Hindu. In Taliban-held areas, Islam was the dominant force in everyday life, imposing a draconian form of sharia law. Under this legal system, all tenets of the Muslim faith were adhered to, or a punishment was meted out. Religious police carried small whips, which they used to publicly flog people if some aspect of their appearance or behavior was not in compliance with Muslim law. Hangings took place on a regular basis. Women were not allowed to receive an education and only worked outside the home if they were involved in health services. Conversion to another faith could be punishable by death. There was an initiative on the part of the ruling Taliban to make Hindus wear identity badges – ostensibly to protect them from the religious police.

SECTION X: KEY CITIES

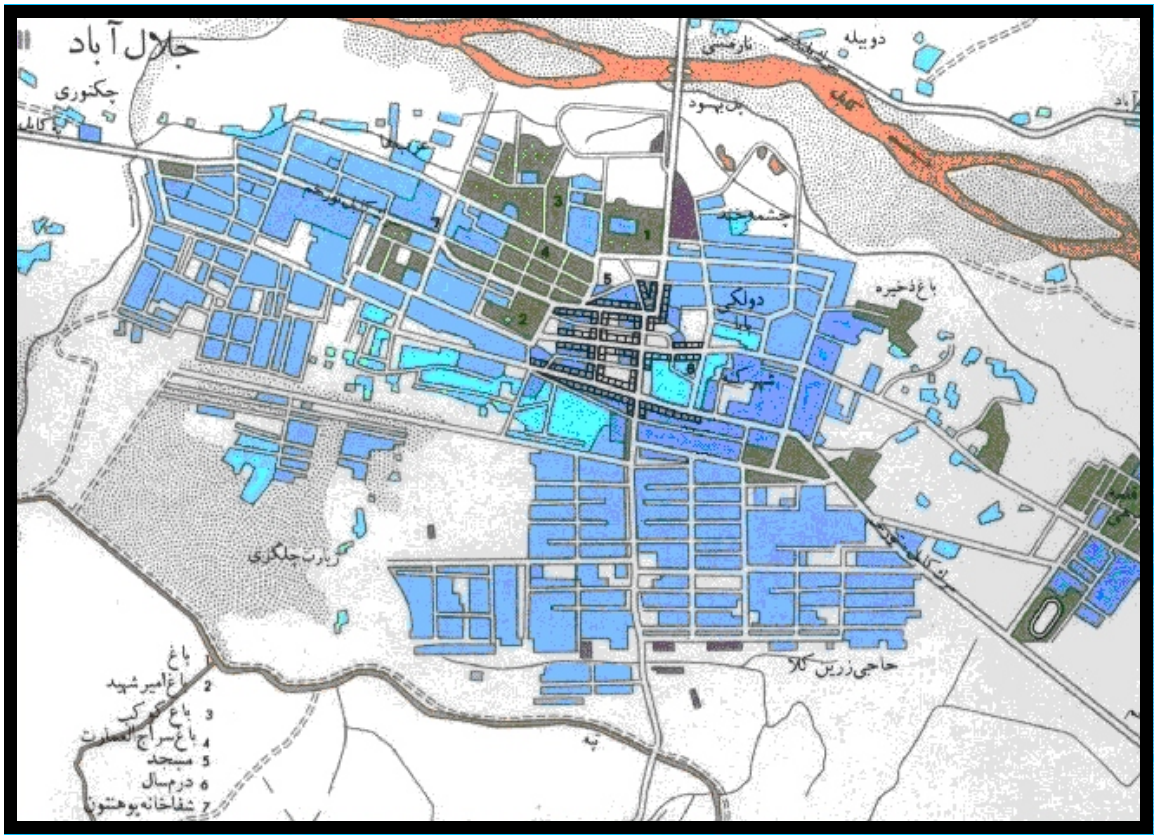
Kandahar. Kandahar is located is southern Afghanistan, approximately 500 kilometers (310 miles) southwest of Kabul and 90 kilometers (56 miles) northwest of the Pakistan border. The city lies at the northeast corner of the vast, nearly uninhabited Dasht-i Margow. Kandahar is in an area of subtropical steppe. Sand ridges and dunes alternate with expansive desert plains. There are also areas of barren gravel and clay where sparse vegetation and low growth prevail. Kandahar's population is estimated at 329,300 (U.S. Census Bureau, 2001).



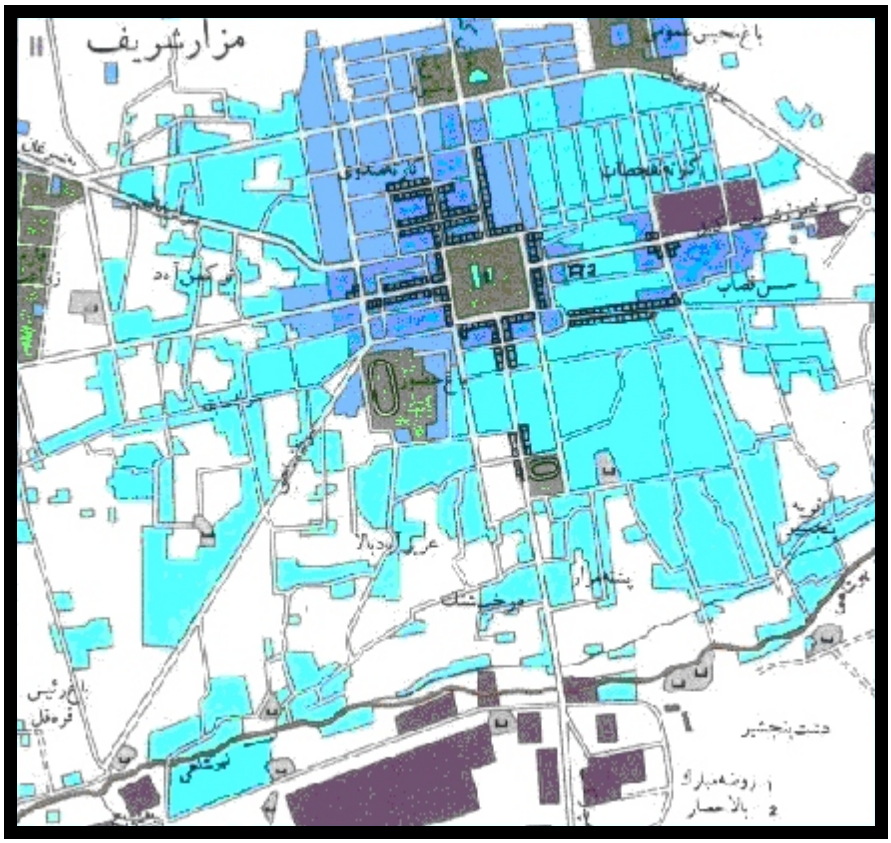
Kabul. Kabul is located in northeastern Afghanistan on the banks of the Kabul River. The city spreads out on the north and south banks of the river and is further separated into northern and southern sections by a series of low hills. The Kabul River flows from southwest to northeast and through the water gap known as "Lion's Gate," which divides the hills. Elevations range from 1,789 meters above sea level at Kabul International Airfield to 2,219 meters at Kohe Sher Peak near the city center. Several small streams flow in from the west, joining to form the Cheltan River, which, in turn, joins the Kabul River just south of the Lion's Gate. The Logar River flows north to join the Kabul River in eastern Kabul; Khargz Lake, about 20 kilometers west of central Kabul, is the only lake in the region. There are, however, several small marshes scattered across the northeastern half of the city and environs. Soils on the mostly flat plains around Kabul are deep silty sand, clayey sand, and gravels that are fair to good in over-all suitability for construction purposes. On hill slopes, bedrock outcrops comprise half or more of the surfaces.



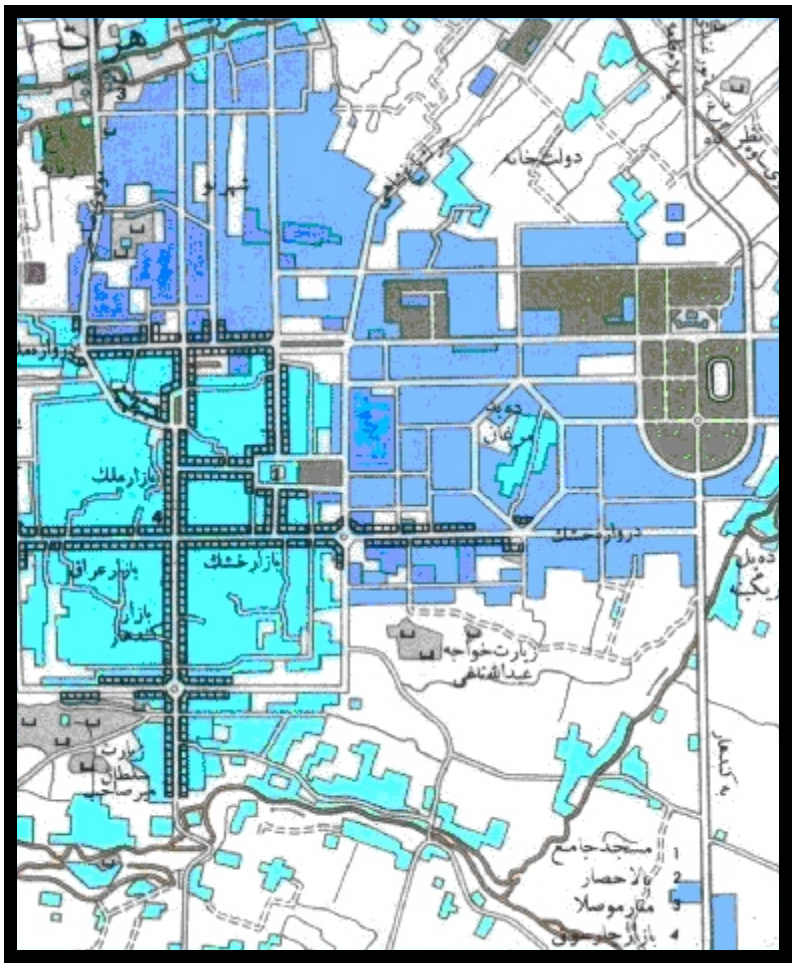
Jalalabad. Jalalabad is the largest urban center in eastern Afghanistan between Kabul (125 kilometers [78 miles] to the west) and the Pakistan border at the Khyber Pass (75 kilometers [47 miles] to the east). The city has been an important commercial, telecommunications, and cultural center, and has a population of 154,200 (U.S. Census Bureau, 2001). The city dominates the entrances to the Laghman and Kunar valleys and is a leading trading center with India and Pakistan. Oranges, rice, and sugarcane grow in the fertile surrounding area, and the city has cane processing and sugar refining as well as papermaking industries.



Mazar-e Sharif. Mazar-e Sharif, the provincial capital of the Balkh Province, is situated on the main route between Kabul and the Termiz, Uzbekistan. Historically, its importance was twofold: it was 70 kilometers (43 miles) south of the Soviet Union, and it was a center for Afghanistan's fledgling oil industry. Its population is estimated at 232,800 (U.S. Census Bureau, 2001).



Herat. Herat is centered in western Afghanistan on the flat river plains a few kilometers north of the Harirud River. The Iran border is approximately 120 kilometers (75 miles) to the west, Turkmenistan 110 kilometers (68 miles) to the north, and Kabul is approximately 650 kilometers (400 miles) to the east. Elevations within the city range from roughly 920 meters (3,018 feet) ASL in the south to 960 meters (3,150 feet) ASL in the north. Mountains ranging in height from 1,800 meters to 3,300 meters (about 6,000 to 11,000 feet) surround the city. Earthquakes and tremors are common occurrences. Herat experiences a hot, north-northwesterly wind from May to September. This wind blows constantly, but is particularly strong in the afternoon; wind velocity is typically around 50 miles per hour (43.5 knots), with gusts up to 80 miles per hour (69.5 knots).



SECTION XI: CULTURAL FACTORS

Even though ethnicity has only recently surfaced as a central issue, ethnic divisions and internal colonization have existed in Afghanistan for the last 250 years. Since Ahmad Shah Durani founded the Afghan state in 1747, various Pashtun-dominated regimes (monarchic, republican, communist, Islamist) have used the powers and institutions of the central government to colonize the non-Pashtun ethnolinguistic areas. To this end, Pashtun regimes tried various Pashtunization measures (political, educational, linguistic, economic, demographic, social, and economic) to suppress and weaken other ethnic communities and their hold on territories and to ensure Pashtun supremacy and domination.

Pashtun domination ended with the Soviet invasion of Afghanistan in 1979, when Babrak Karmal, leader of the Parcham faction of the People's Democratic Party of Afghanistan (PDPA), became president. The Parcham, unlike the Khalq faction, was composed mostly of non-Pashtuns. The Tajiks, Hazaras, Uzbeks, and other minority ethnic groups were allowed equal participation in politics, education, economics, and other aspects of life in the Afghan communist government. Under its so-called nationalities policy, minority languages and dialects – such as Hazaragi, Uzbeki, Baluchi, Pashai, and others – began to flourish, and Tajiks, Hazaras, Uzbeks, and other minority ethnic groups were appointed to positions in the foreign ministry, including diplomatic posts abroad, as well as in the Ministries of Defense and Interior.

These opportunities changed the balance of power for the minority ethnic groups inside Afghanistan. By the time the Soviet forces withdrew in 1989, there were many more Tajiks, Hazaras, Uzbeks, and other minorities than ever before serving as pilots, engineers, doctors, ambassadors, military generals, ministers, central committee members, governors, university professors, and so on. One Hazara, Sultan Ali Keshtmand, even became prime minister, something unthinkable during the Pashtun-dominated regimes in the past.

The situation among the Afghan refugees in Pakistan during the Soviet occupation was different, however. In Pakistan, the Pashtuns dominated the Afghan refugee political parties. Of the seven political groups in Peshawar, Pakistan, only one – the Islamic Society (Jamiyat-e Islami) headed by Burhanudin Rabani – was non-Pashtun; the others were all Pashtuns, either linguistically or genealogically. This meant that most of the cash and weapons provided by the United States, Saudi Arabia, and others went to the Pashtuns, as well as the lucrative jobs related to the humanitarian assistance agencies and other organizations helping the Afghan refugees.

When the Islamic groups came to power in 1992, the ex-communists in the government joined the mujahidin according to their ethnic affiliation. The Pashtuns sided with Gulabudin Hikmatyar's Islamic Party (Hizb-e Islami) – a Pashtun party – while the non-Pashtuns supported Ahmad Shah Massoud, a Tajik and Rabani's military commander, and his Supervisory Council (Shoray-e Nezar)/Islamic Society (Jamiyat-e Islami). This division established the parameters for the beginning of a civil war based on ethnic divisions.

In 1994 when Gulabudin Hikmatyar, a Pashtun and the creator of Pakistan's ISI (Interservices Intelligence) failed to rally the Pashtuns and to seize Kabul from Tajik Massoud, the Taliban, a Pashtun-dominated Islamic militia said to have been created and supported by Pakistan and some Arab countries – especially Saudi Arabia and the United Arab Emirates – took over the fight for Pashtun domination. Pakistan, with its own significant Pashtun minority, has been exploiting the ethnic and sectarian conflict for its own objectives. Iran and Uzbekistan, and to some extent Tajikistan, feared the Islamic fundamentalism of the Taliban and assisted the non-Pashtuns with whom they have an ethnolinguistic and cultural affinity. This has intensified the

ethnic conflict in Afghanistan.

Since 1997 some ethnic cleansing has also taken place in which the Hazaras and the Pashtuns have reportedly massacred thousands of each other's people in Mazar-e-Sharif, in Bamyan, and in other regions. Also, the Taliban have reportedly evicted Tajiks from the Shomaly Valley north of Kabul and sent them to Kandahar along with some Hazaras and other members of minority ethnic groups. There are reports that the Taliban have brought Pashtuns to settle on the land and in the houses taken from dislocated Tajiks, Hazaras, and others.

SECTION XII: NATIONISM AND NATIONALISM

The ethnic issue poses problems of terminology. The words "nation" (mellat) and "nationality" (melliyat) with their European origin do not have the same meaning in the Afghan context or among the various ethnic groups. In the West, "nation" implies citizenship and refers to a "community of people composed of one or more nationalities and possessing a more or less defined territory and government," it has a completely different meaning to the Afghan ethnic groups. To the Pashtuns, "nation" subsumes a combination of notions, encompassing geography, ancestry, language, religion, culture, and nation-state. In the Pashtuns' view, the Afghan nation refers to those people who originally settled near the Suleiman Range and spread to what is now modern Afghanistan and Pakistan. Pashtun nationalists say "Afghan" also refers to the descendants of the Prophet Ibrahim. Furthermore, they insist the Afghan nation belongs to the people who have been speaking Pashto as a native language for many generations. To the Pashtun nationalists, the Afghan nation also refers to the "real" citizens of Afghanistan – a "typical" or "true" Afghan is a conservative, orthodox Sunni Muslim. Most importantly, to the Pashtun nationalists, real Afghans are those who have Pashtun tribal customs and traditions. This may explain why their well-known nationalist political party and their newspaper are both named "Afghan Mellat" and "Afghan Nation" (that is, Pashtun Nation). According to nationalist Pashtuns, an individual is considered an Afghan if he possesses "all" of the above qualifications, not just one or two. For example, speaking Pashto as a native language or being a Sunni Muslim alone does not make one an Afghan citizen, at least in the eyes of the nationalist Pashtuns.

The non-Pashtuns have their own interpretation of these terms. Unlike the Pashtuns, they do not identify themselves as a nation (mellat) because they do not feel they were treated as "real" citizens with equal rights by the Pashtun-dominated regimes. Instead, they refer to themselves as nationalities (melliyat) or ethnic groups (qawm). While the word "nation" specifically refers to territorial boundaries, melliyat identifies a specific group on the basis of such cultural factors as language, sect, customs, mores, ideals, cultural habits, and traditions. In the Afghan context, melliyat and qaumiyat are synonymous and can be translated as "ethnicity," although melliyat is more general than qaumiyat because a melliyat can consist of more than one qawm. To non-Pashtuns, only the Pashtuns are referred to as a nation because they have had the nation-state and the political system under their control, without giving equal rights to the minorities. In fact, the Tajiks, Uzbeks, Hazaras, and other minority groups refer to the Pashtuns as "Afghans." "Afghanistan" literally means "the land of the Afghans" (that is, Pashtuns). That is why when asked about their identity, these non-Pashtun ethnic groups call themselves "Hazaras," "Tajiks," "Uzbeks," and so on instead of "Afghans."

In Afghanistan one's loyalty is still first and foremost to the family, qawm/tribe, sect, and even geography (place of birth) instead of to the "Afghan nation" as a whole. In the words of one non-Pashtun diplomat, "It is hard to ascribe any other term [Afghanistan] to [the territory called

Afghanistan] including country, nation, government, and national identity . . . Ethnic, familial blood determines everything." The precise ranking of loyalties in a given situation depends on what is at issue. As a general rule, religion/sect or ideology supersedes ethnolinguistic group or tribe/qawm. During the Soviet occupation, all the Afghan ethnic groups united against the communists in a holy war. After the defeat of the communists, ethnicity became the issue. For example, when the mujahidin took Bagram military airport north of Kabul in 1992, the Pashtun communists joined the forces of Gulabudin Hikmatyar, a Pashtun, and the Tajik communists joined Ahmad Shah Massoud.

SECTION XIII: DANGEROUS PLANTS AND ANIMALS

Afghanistan has a number of large mammal species those could pose a threat to U.S. personnel. Brown bears, Siberian tigers, and several species of leopards inhabit the mountains and foothills. Wolves, striped hyena, jackal, wild pigs and wild dogs are widespread. In addition, soldiers should expect to encounter numerous venomous reptiles, insects, and plants.

CHAPTER IV: Somalia Country Study

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SECTION I: GEOGRAPHY

A. Location and Description

Somalia is located in the northeastern section of Africa known as the Horn of Africa. It occupies a land area of approximately 637,600 square kilometers (185,655 square nautical miles), which is slightly smaller than Texas. The country consists of the area comprising the former colonies of Italian and British Somaliland. The south and east coast were formerly under Italian administration, and the area along the Gulf of Aden coastline was the British colony. The country is shaped like the figure "7", or an open jackknife.

The northern and eastern boundaries of Somalia are the Gulf of Aden and the Indian Ocean respectively. The total coastline is approximately 2,500 kilometers (1,350 nautical miles) with 1,000 kilometers (539 nautical miles) bordering the Gulf of Aden and 1,500 kilometers (809 nautical miles) bordering the Indian Ocean.

The border with Djibouti is 58 kilometers (31 nautical miles) long. It begins along the Gulf of Aden and runs on a straight line southwesterly to the Djibouti-Ethiopia-Somalia tri-point located at Madaha Jalelo, a hill.

The border with Ethiopia is approximately 1,600 kilometers (863 nautical miles) long. Beginning at Madaha Jalelo, the border runs in a southeasterly direction.

The border between Somalia and Kenya is 682 kilometers (368 nautical miles) long. At the Kenya Ethiopia-Somalia tri-point, the boundary runs southwest in straight-line segments to the town of El Wak. It then runs north to south and then southeasterly to the Indian Ocean.

B. Weather and Climate

As a result of Somalia's geographical position, the climate of southern Somalia is equatorial, while the north is generally described as subtropical. The country is uniformly hot, with the most oppressive heat occurring along the northern coast during the summer. Rainfall varies greatly in both total amount and reliability throughout the country. Humidity is high along the coast and in the south, and somewhat lower in the northern highlands.

During the winter season, late December through February, high-pressure cells over Arabia result in northeast winds over much of Somalia. Occasional cyclonic storms may arise over the Red Sea and Gulf of Aden during this period, blown to the southwest by the winds generated by these high-pressure systems.

In the spring, starting in mid-March, most of southern Somalia is under the effect of the inter-tropical convergence zone (ITCZ). Winds are generally southerly or southeasterly during this period. Northern Somalia and the Gulf of Aden generally have northwesterly winds during this time.

April is the onset of the southwest monsoon over southern Somalia. Low pressures over India and Pakistan result in moisture laden, southeasterly winds moving onshore over the coastal regions of Somalia. The ITCZ proceeds northward over Somalia during this period. By June, the entire country is under the effect of the southwest monsoon.

Starting in September the northern coastline comes under the influence of dry, stable air resulting from high-pressure systems over the Middle East and Asia. During this period southern and central Somalia are under the effect of the southward movement of the ITCZ, resulting in unstable weather.

1. Precipitation: There is a marked variability in the amount and reliability of precipitation throughout the country. Precipitation increases toward the south, with a large area of the south receiving in excess of 58 centimeters (23 inches) in most years. The north coast generally receives less than 10 centimeters (four inches) per year. The interior plateau receives 25 to 48 centimeters (10 to 19 inches) per year. The southwest monsoon, beginning in April, is responsible for most of the precipitation.

2. Temperature: Temperatures in Somalia are relatively uniform throughout the year because of the equatorial location and lack of significant mountain ranges. The average annual temperature for most coastal locations is 80ºF, although the northern coastal region has temperatures approaching 113-115ºF during June and July. Winter temperatures in this region may reach as low as 54-57ºF.

C. Topography

Most of Somalia is desert or semi-desert; drought is a year-round threat. Approximately 60 percent of Somalia is savannah woodlands, which is used as rangeland and as the primary local source of fuel. Only about 13 percent of the land can be cultivated, and much of that is not farmed on a regular basis. Cultivation of arable land occurs primarily in southern Somalia. Somalia has rich fishing grounds and the longest coastline in Africa.

Mountains are limited to the northern part of the country, while the entire southern and eastern sections consist of a narrow coastal plain and a large interior plateau. Extensive undulating plains, which are interrupted occasionally by areas of dissected terrain and isolated hills, characterize much of Somalia. The country can be divided into four distinct geographic regions: the *Guban*, a plain along the northwestern coastal area extending north into Djibouti; the *Northern Somali Mountain* area in northern Somalia; the S*omali Plateau,* subdivided into a northern and southern section, located along the Ethiopian border; and the *Coastal Plains* along the Indian Ocean shore.

1. The Guban

The low-lying country from the western boundary with Djibouti, and extending eastward along the Gulf of Aden, is locally referred to *the Guban*. The extreme northwest section of the Guban is covered with barren lava fields originating in Djibouti, with additional lava flows immediately west of Berbera. The lava plain ends in a series of low hills and merges into an alluvial plain. The plain is up to 80 kilometers (43 nautical miles) wide from north to south near Seylac and extends eastward to beyond the town of Berbera. The plain becomes narrower as it extends in an eastward direction, at the town of Bullaxaar, subsequently to widen again around Berbera. This plain rises gently up to the piedmont area of the Northern Somali Mountain region.

2. Northern Mountains

The highest elevations in Somalia are found in the Northern Somali Mountain region located along the Gulf of Aden, stretching from the Somali-Ethiopian border in the west to the coast of the Arabian Sea in the east. In places, the mountains are in close proximity to the shore along the Gulf of Aden. The average elevation for this mountain range is about 2,000 meters

(6,561 feet). At its highest point, Shimber Berris, located about 19 kilometers (10 nautical miles) northwest of Erigavo, is 2,410 meters (7,906 feet). A fault zone delineates the northern front of the mountains. The boundary of the uplifted area is separated from the Gulf of Aden by a coastal plain varying in width from 60 kilometers (32 nautical miles) in the west to less than 1 kilometer (.5 nautical miles) in the east.

Dry watercourses, locally called tugs, dissect the mountainous region. These are dry for most of the year, but usually contain water for several hours after a rain. Many of the tugs form deep gorges and gullies. The gorges' alignment is predominantly north to south. The tugs provide the water and the fluvial deposits for the geographic region lying south of the mountain belt, the Northern Somali Plateau.

3. The Somali Plateau (Subdivided)

Northern Somali Plateau. The plateau, located in northern Somalia just to the south of the Northern Somali Mountain region, consists primarily of alluvial plains. The Somali refer to this region as the Haud. The Haud plains are wide and open, nearly level, and slope gently to the south. The elevation changes over a distance of about 300 kilometers (161 nautical miles) from an average of 1,200 meters (3937 feet) near the northern mountains to about 700 meters (2297 feet) at the boundary with Ethiopia. Curious features of this landscape are the anthills and termite mounds. Termite mounds can reach a height of 8 meters and stand as hard, irregular pillars. Anthills are found only in areas where there is limestone with a thin covering of alluvium.

Southern Somali Plateau. The Southern Somali Plateau region is located between the Webi Shabeelle and the Webi Jubba; "Webi" meaning seasonally flowing river in Somali. The plateau is comprised of gently undulating limestone surfaces with occasional, isolated low hills. The plateau extends eastward from the Ethiopian border. Where the plateau reaches the coastal plains in the east, crystalline rocks replace the limestone surface. The change from plateau to coastal plain is almost unnoticeable except north of Webi Shabeelle, where there is a short steep escarpment.

4. Coastal Plain

The Coastal Plain area stretches from the southern tip of Somalia along the Indian Ocean as far north as Hurdiyo. The plains become progressively narrower as the Northern Somali Plateau reaches closer to the coast in the northern areas. North of Hurdiyo the plateau reaches the coast.

The Coastal Plain is a low-lying area with elevations below 300 meters (984 feet). The two major rivers cited above, the Webi Shabeelle and Webi Jubba, traverse the plain. These rivers are flanked by natural levees. On the plain, flanking the rivers, are numerous depressions called descecks, which fill with water during the rainy season and during floods.

The Coastal Plain region, on which Mogadishu lies, is the largest geographic region in Somalia. The plain is "emergent," gradually uplifted along most points along the Indian Ocean. As a result, beaches along the coast are often short and steep with irregular formations near shores and backed by cliffs of coral or limestone on the backshore. The coastline is often terraced, and unstable "blowout" dunes up to 50 meters (164 feet) high are scattered along the entire length of the coast from Kenya northward almost to the Gulf of Aden. As one moves inland from the coast, the terrain gradually ascends in a series of undulating stabilized dunes and sandy plains, interrupted only by the shallow but wide flood plain of the Webi Shabeelle.

D. Vegetation

Climate, elevation, man, and soil affect the vegetation in Somalia. Climate has the most pronounced effect, with annual rainfall being the dominant climatic factor. More specifically, due to the importance of precipitation, this dictates the types of vegetation capable of surviving the harsh environment common throughout the country. Elevation is also a controlling factor in determining the type of vegetation found in an area due to the various temperature ranges, particularly colder temperatures, which are common to mountainous regions. Cold temperatures, coupled with a paucity of water, create the harshest conditions for vegetation. Besides climate and elevation, human activity also contributes to controlling or modifying the vegetation regimen in the region. Over one-half of the population is nomadic animal herders, and their overgrazing herds of goats, sheep, camels, and cattle have caused widespread change in vegetation throughout the country. This has led to the increasing problem of decertification, especially during periods of drought of recent years. Aside from human activity, the soil will affect the occurrence of a particular type of vegetation.

The coastal areas in Somalia are strongly affected by the intrusion of salt from the ocean. Subsurface movement of ocean water and its subsequent rising to the surface, coupled with evaporation, causes the deposition of salts on the surface. The intrusion of saltwater is aided through the extensive use of ground water, little precipitation, and destruction of ground cover due to overgrazing. The salt flats are entirely void of vegetation.

Irrigation projects have also modified vegetation in Somalia. There are large irrigation projects along the Webi Jubba and Webi Shabeelle. Agriculture products, such as bananas and papayas, are grown in the region. Rice is also cultivated in the vicinity of the Webi Shabeelle.

1. Natural vegetation types in the four geographic regions:

The Guban area has broadleaf evergreen vegetation. This region is characterized by dry climatic conditions. The vegetation includes acacia trees, about three meters (10 feet) high, scattered throughout the region, with thorny acacia bushes and other shrubs. Grasses grow sporadically in the region. Tall tamarisk trees grow along dry river courses as well as in large tug beds. The smaller tug beds only support grasses and brush along their banks. The sand dunes in the Guban area support bunch grasses. Low sand dunes support grasses or salt bushes, but not both.

The northern mountain vegetation is mainly controlled by elevation and secondarily by precipitation and soils. The northern mountain region has three distinct regimes depending on altitude: open woodland, shrub evergreen, and juniper. The open woodland consists of acacia trees that range in height up to eight meters. Interspersed with these trees are low shrubs. The acacia trees are found up to 1,500 meters (4,921 feet) in elevation. Above 1,500 meters (4,921 feet), vegetation changes to needle leaf evergreen shrubs ranging from one meter (3 feet) to four meters (13 feet) in height. The acacia open forest that stood in large segments of northern Somalia has died off and now remains as a dead forest, giving the area a bleak appearance. The death of these trees is due to drought and overgrazing.

The shrub evergreen vegetation gives way to juniper at the highest elevations in the mountain areas. The juniper trees grow close together. The scrubs form locally dense thickets in scattered pockets throughout the area. Trees are generally more than eight meters (26 feet) tall, but local inhabitants cut the forest for poles. This area has also been heavily grazed.

The Northern Somali Plateau is characterized by open spaced bush-type vegetation. Its mixed deciduous vegetation consists of acacia and commiphora. This region has experienced overgrazing to such a degree that large areas are devoid of trees. The result is that significant areas are devoid of vegetation. Shrub vegetation that remains in this area varies in height from one meter (3 feet) to five meters (16 feet). Occasionally a tree may reach a height of 10 meters (32 feet).

Throughout the northern plateau area, there are places where pools of water form after rain. These pools may vary from a few meters across to several hundred meters. These pools generally last for a day or two. The soil in these pools is usually gray, sandy clay, which will crack when dried. The small temporary pools support grass clumps from one meter (3 feet) to two meters (2 feet) in height. The larger pools are known locally as "ballehs." These may retain water throughout the year, although the water level drops. The dry balleh floor does not support any vegetation. Along the edges, however, bunch grasses and scattered acacia trees grow.

The vegetation of the Southern Somali Plateau is predominantly bunch grasses with scattered acacia trees in areas that have a moisture source, such as watercourses. Very little agriculture is practiced in the area due to sparse precipitation.

The Coastal Plains are divided into two separate zones. Short grasses interspersed with isolated trees and brush vegetation characterize the northern section, located north of the Webi Shabeelle. Along the tugs some tree growth occurs. The grassland in this area is used for grazing. In the areas along the Webi Shabeelle and Webi Jubba, dense vegetation is found along the river channel. South of the river, typical savannah vegetation takes over, characterized by grass-covered areas with trees growing along the river channels and near sources of water.

2. Cultivated Cropland

Cultivated cropland is confined to two areas: the hills and high plains north and west of Hargeysa and the land along and between the Webi Shabeelle and the Webi Jubba. Agriculture along the two rivers is based on controlled irrigation or field inundation during high water periods. Primary crops are bananas, sorghum, and millet. Bananas are a major source of export income for Somalia. Other crops consist of corn, wetland rice, beans, and sesame. Near Hargeysa and on the land between the two rivers, agriculture consists of small plots of crops sustained by natural rainfall. Other crops grown include groundnuts, cowpeas, mung beans, and corn.

E. Drainage

Somalia has only two perennial rivers, the Webi Shabeelle and Webi Jubba. The rivers originate in Ethiopia and flow southward into southern Somalia. The Webi Jubba is more than 150 meters (492 feet) wide and unfordable during high water levels that occur from May through June and September through November. The river is fordable in places during the other months when the low water period prevails. In the driest years, the Webi Jubba is fordable throughout its course and dries up for short periods south of Baardheere. The Webi Shabeelle flows south from Ethiopia to Balcad, about 30 kilometers (16 nautical miles) north of Mogadishu. The banks of the Webi Shabeelle at Beled Weyne vary in height from two to six meters (6 to 19 feet) depending on the water level of the river. The terrain directly adjacent to the river is relatively flat, although the terrain rises rapidly to the north. The Webi Shabeelle runs through a large

swampy region near the coast through numerous natural channels and diversions for 360 kilometers (194 nautical miles) to a confluence with the Webi Jubba at Jilib. During the high water season, this portion of the Webi Shabeelle floods extensively. The river is not perennial in this area, but dries up for about two months during the dry season. The Webi Shabeelle is unfordable in much of its course from the Ethiopian border to Balcad during the high water periods.

Except for the Webi Shabeelle and the Webi Jubba, all streams are intermittent. Watercourses are widely separated and usually contain water for only a few hours following a rainstorm. Water levels rise rapidly and flashfloods occur. Streams are most likely to have water during April, May, October, and November. Stream banks are low and sandy or clay on the plains and deeply entrenched between high, steep rocky banks in the hills. Bottoms generally consist of boulders in the hills and sand and sandy gravel elsewhere. From the Webi Shabeelle north to Garoowe, drainage is disorganized and rainwater sinks into the ground after flowing a short distance. Few watercourses reach the sea.

In the Northern Somali Mountains and the Guban, streams flow northward or into the Gulf of Aden. Stream channels and waterholes are usually dry and carry water only for periods of a few hours to a week after heavy rains during July and August. When streams are flowing, they are fairly deep and swift in their upper courses and broad, shallow quagmires in their lower courses. Stream banks are usually high, steep, and rocky in upper courses and generally low, ill defined, and sandy in lower courses. Bottoms consist primarily of boulders, cobbles, and gravel in the upper courses and sand and sandy gravel in lower courses.

F. Cross-Country Movement (CCM)

Suitability for cross-country movement in Somalia is heavily dependent on weather. During the dry conditions that prevail most of the year, cross-country movement conditions are good in nearly all of Somalia. The only severe restrictions that may be encountered are the steeper slopes of the mountains in the north and the escarpments facing much of the East Coast. During wet periods, movement of personnel on foot would be limited for periods of hours to days by flowing streams. However, only the Webi Jubba and the Webi Shabeelle pose long-term obstacles. Throughout the year personnel on foot must take great care, especially in low light conditions, to avoid thorn bushes. Thorns up to eight centimeters (3 inches) long can cause serious injury, even penetrating the sole of a combat boot. Dense thickets of thorny shrubs and cactus may obstruct movement locally. In populated areas, closely plated hedges of thorn bushes marking borders of fields and fencing livestock would hamper travel. During dry periods in most locations, wheeled and tracked vehicles can cross most of the country, but they would be impeded significantly by rocky ground and sand dune fields in the Guban, by moderate to steep slopes and stream channels in the hills and mountains, and by steeply cut banks and sandy beds of intermittent streams. Under wet conditions, wheeled and tracked vehicles would be slowed or obstructed in most areas.

SECTION II: POPULATION AND DEMOGRAPHY

A. Demographics

All figures are 2001 estimates unless otherwise noted.

Population: 7,488,773*
Density: 11.9 persons per square kilometer of land
Birth rate: 47.23 births/1,000 population
Death rate: 18.35 deaths/1,000 population
Net migration rate: 5.96 migrant(s)/1,000 population
Population growth rate: 3.48%
Population doubling time: 233 years
Total fertility rate: 7.11 children born per woman
Infant mortality rate: 123.97 deaths/1,000 live births
Life expectancy: males 44.99, females 48.25, total 46.6
Urban/rural population distribution: 28% urban/72% rural
Sex ratio: 1.01 male(s)/female
Age structure: 0-14 years: 44.54% (male 1,670,320; female 1,665,329)
15-64 years: 52.69% (male 1,993,750; female 1,952,437)
65 years and over: 2.77% (male 91,511; female 115,426)
Population projection, 2010: 9,922,031
Number of military-aged males (15-49): 1,825,302 (1,011,398 fit for service)

* A census has not been taken since 1975. Population estimates vary widely, ranging between 7-10 million.

B. Area and Population

Somalia occupies 637,657 square kilometers, a size slightly smaller than Texas.

Region	Population, 1998*	Region	Population, 1998*
Awdal	212,250	Lower Shabeelle	809,446
Bakol	212,510	Middle Juba	389,730
Banadir	950,310	Middle Shabeelle	394,392
Bari	171,090	Mudug	263,340
Bay	621,616	Nugal	105,120
Galgudud	370,997	Sahal	55,110
Gedo	280,945	Sool	190.455
Hiran	258,071	Togdheer	270,606
Lower Juba	331,715	Woqooyi Galbeed	354,225

* Source: UN Children's Fund. Does not include nomads or refugees.

Population of Principal Places, 2001*

Mogadishu	1,000,000
Hargeisa	111,000
Kismet	50,000
Berbera	35,000
Borama	30,000

* Population figures better illustrate relative sizes rather than actual population numbers. Populations of Somali cities change frequently depending on political and climatic conditions.

C. Ethnic Composition. Eighty-five percent of the people of Somalia are Somalis, who are divided into numerous clans that provide the basis for group identity. Bantus predominate in a few coastal areas in the south. Nearly all the Arabs and all of the Italians that used to live in Somalia have departed.

D. Language. The vast majority of Somalis speak Somali or one of its regional derivatives. Approximately 50,000 persons speak Bantu languages and only on the coasts near the Kenyan border. Despite the fact that Arabic is a national language, few people actually speak the language at any level of society.

E. Religion. Somalia is almost universally Sunni Moslem. In 1997 there were an estimated 200 Roman Catholics in the country.

F. Education. There are few functioning educational institutions due to the recent hostilities. No reliable data are available.

G. Labor and Economy. In 1997, the labor force was estimated at 4,416,000. Of these, 3,201,000 (72.5%) were employed in the agricultural sector, often at the subsistence level. Those not involved in agriculture are either unemployed or work in the informal sector.

1. The Economy

In the prolonged absence of a central government, Somalia's war-torn economy as a whole has experienced long-term recession and deterioration. During the 1990s, the gross domestic product (GDP) shrank in inflation-adjusted terms by 75 percent. For 2000, the estimated GDP amounted to $1.7 billion, or only $170 per capita (among the lowest in the world). Of 170 countries, Somalia ranks near the bottom on the United Nations Human Development Index – a composite measure of life expectancy, adult literacy, and real GDP per capita.

Civil war, drought, and livestock disease have decimated Somalia's economic sectors, which remain fragmented by the three main opposing regional administrations of the country (the Transitional National Government in the south, Puntland in the northeast, and the Somaliland Republic in the northwest).

a. Agriculture. Cattle husbandry is the mainstay of economic activity and provides the primary source of food and foreign exchange earnings. In 2000, countrywide stock-rearing accounted for about 40 percent of GDP and 65 percent of export earnings. This sector was hurt when Saudi Arabia and other Gulf states imposed a ban on the import of Somali livestock following an outbreak of Rift Valley fever. Also, drought is causing hardship in all parts of Somalia.

b. Manufacturing. Some private food-processing and boat-building businesses in a few of the larger settlements are now all that remain of the small manufacturing sector.

c. Mining. Somalia's mineral resources have undergone little exploration. Commercially exploitable deposits of gold, silver, tungsten, manganese, titanium, chromium, and nickel remain undeveloped. A cement factory and a gypsum plant at Berbera, which used local non-metallic mineral deposits before the civil war, are no longer operating.

d. Services. Somalia's retail trade, hit hard by the civil war, is supplied largely by the informal sector. Mogadishu's main market, Bakara, offers a wide range of consumer goods and weaponry.

e. Trade. Officially recorded foreign trade, which has suffered greatly because of the civil war, virtually ceased in September 2000 when the livestock ban caused a loss of sales, export levies, and port revenue, severely affecting the economies of Somaliland and Puntland.

f. Finance. Primary sources of "government" revenue are import duties, overseas remittances, and informal duties and taxes.

- Import Duties: Duties levied at the port of Berbera generate a large share of government revenue in Somaliland.
- Overseas remittances: Private transfers from the Somali diaspora are another important source of Somaliland's income; estimated remittances amount to as much as $500 million a year.
- Informal Duties and Taxes: In many areas, duties on "qat" (a mild narcotic) and taxes collected by clan factions represent significant sources of income. Most of these proceeds are paid to conventional government employees in Somaliland and to clan faction militias in the rest of the country.

2. Defense Spending. Defense spending by the ruling factions is probably minor because of limited means to generate revenue. In the year 2000, estimated spending for military-related forces of the Somaliland Republic and clan militias totaled $15 million, or less than one percent of the GDP.

SECTION III: CLANS AND FACTIONS

A. Background

Approximately 94 percent of Somalia's eight million inhabitants are members of six major clan families. Centralized rule in Somalia ceased with the fall of the Siad Barre regime in 1991 and was replaced by several competing regional administrative areas and local warlord fiefdoms supported by the major clans and their subgroups. Any efforts to target Al-Ittihad Al-Islami (AIAI) could have the undesired effect of alienating the clans, particularly in the event that unintended collateral damage results. Since AIAI personnel also belong to a clan, it would be very difficult to attack them without appearing to attack the clan to which they belong. Doing so could spur wider conflict in Somalia and undermine the modicum of order it has achieved since 1995.

B. Somalia's Clan Structure

Somalis are divided into clan families. The six major clan families are the Darod, Dir, Hawiya, and Ishaak, which account for about 74 percent of the population, and the Digil and Rahanwein, which make up another 20 percent. There are also many sub-clans. The first four clan families are generally pastoral nomads. They consider themselves superior to the Digil and Rahanwein who practice farming.

The main clan families are interspersed throughout the country. They are not located in single discrete regions. The Darod inhabit a broad swath extending from the Ethiopian border in central Somalia to the northeast, but they are also found in far southern Somalia near the Kenyan border. The Dir occupy the northwest. The Ishaak are found between the Dir and the Darod in the far north. The Hawiya are mostly located in south-central Somalia in a large area from the seacoast to the Ethiopian border. The Rahanwein inhabit the south-central part of the country near the Ethiopian border, while the Digil are found in small enclaves in the southeastern part of the country.

All clan families and sub-clans maintain armed militias and look to their traditional home territories as a power base, manpower pool, and place of refuge. In most cases, an armed faction's area of influence and operations corresponds to its supporting clan's home territory. Supplies can be looted or furnished by allies, however, offsetting personnel losses is more problematic as there is a limited manpower pool. Warlords can depend only on soldiers belonging to their sub-clans to fill manpower levies. Havens provided by clan holdings are not limited to Somalia proper, but can extend into neighboring areas inside Ethiopia and Kenya that are populated by ethnic Somalis.

Normally, clan affiliation is the most important single factor in determining factional alignment, but it is not always preeminent. The northern third of the country includes the self-proclaimed administrations of Somaliland in the northwest and Puntland in the northeast. Clans in these regions have little direct impact on what transpires in the south. The south, central, and northeastern parts of Somalia is where the majority of clan conflict and famine occurs.

C. Clan Interrelationships

The warlords of the various factions make and break alliances with other warlords based on clan relations, the demand for resources, the need to counterbalance the strength of a rival, revenge, and the advancement of their own fortunes. These factors, in some form, have been present in typical interfactional alliances and disputes.

Yet according to academic experts, most armed conflict in Somalia since 1995 has been within rather than between major clan families. Relations between clans have tended to be extremely fractured. This is qualitatively different from the clan conflict of the 1991-92 period when, for example, the Darod and Hawiya clan families were arrayed against each other following the ouster of Siad Barre and competed for the control of large territorial areas. In recent years, Somali warlords have been focused on localized economic profits more than they have on pursuing national political ascendancy based on military power. Intra-clan fighting has been more common than inter-clan conflict. Clan warlords receive support from external sources. Such support encourages them to believe that they are better off controlling a regional area than aiming to control a Somali state.

SECTION IV: MEDICAL THREATS

A. INFECTIOUS DISEASE RISK ASSESSMENT

The Armed Forces Medical Intelligence Center (AFMIC) assesses Somalia as a **HIGHEST-RISK** country, with an overall disease risk among the worst in the world. Without force health protection measures, mission effectiveness will be seriously jeopardized. The main force health protection emphasis should be on these diseases, which have the greatest likelihood to degrade operations by affecting a large percentage of personnel, or by causing severe illness in a smaller percentage. Greatest-risk diseases are grouped into transmission categories that are prioritized in descending order of risk.

Food-borne and Water-borne Diseases: Diarrhea (bacterial, Hepatitis A, Typhoid/paratyphoid fever Diarrhea), cholera
Vector-borne Diseases: Malaria, Dengue fever, Rift Valley fever
Sexually Transmitted Diseases: Hepatitis B
Animal-contact Diseases: Rabies
Diseases of Potential Risk: These diseases also warrant force protection emphasis. They are assessed to have lower likelihood to degrade operations because they generally affect smaller numbers of personnel or cause mild symptoms. Other diseases assessed as potential risk are those likely present at unknown levels, which under conditions favorable for transmission could degrade operations.

B. Food-borne and Water-borne Diseases of Greatest Risk

Sanitation is extremely poor throughout the country, including major urban areas. Local food and water sources are heavily contaminated with pathogenic bacteria, parasites, and viruses to which most U.S. service members have little or no natural immunity. Diarrheal diseases can be expected to temporarily incapacitate a very high percentage of personnel within days if local food, water, or ice is consumed. Hepatitis A, typhoid fever, and hepatitis E can cause prolonged illness in a smaller percentage. The diseases of greatest risk are listed first, in descending order of expected impact.

1. Diarrhea - bacterial

Risk Assessment:
- An operationally significant number (potentially over 50 percent per month) of personnel consuming local food, water, or ice could be affected.
- Typically mild disease treated in outpatient setting; recovery in less than 72 hours.

2. Hepatitis A

Risk Assessment:
- An operationally significant number (as high as 2-10 percent per month) of personnel consuming local food, water, or ice could be affected.
- Typical case requires convalescence over 7 days.

Transmission Comments: May also be transmitted person-to-person under conditions of poor hygiene and sanitation.

Typical Incubation Period: 28 to 30 days (maximum range: 15 to 50 days).

Risk Period: Year-round.

Risk Distribution: Countrywide (including urban areas).

Surveillance and Survey Data: Most Somalis contract hepatitis A virus infection during childhood. The seroprevalence of hepatitis A was estimated at 96 percent in 1999. A 1992 survey detected antibodies for hepatitis A virus among 90 percent of Somalians tested.

3. Typhoid/paratyphoid fever

Risk Assessment:

- An operationally significant number (as high as 2-10 percent per month) of personnel consuming local food, water, or ice could be affected.
- Febrile illness typically requiring 1-7 days of supportive care with subsequent return to duty.

Typical Incubation Period: 8 to 14 days (maximum range: 3 to 30 days).

Risk Period: Year-round.

Risk Distribution: Countrywide (including urban areas); elevated risk in populated areas with poor sanitation.

Drug Resistance: Regionally, resistance to the standard therapeutic agent chloramphenicol has been reported.

Surveillance and Survey Data: The carrier rate probably is high.

4. Diarrhea, cholera

Risk Assessment:

- A small number (potentially as high as 1 percent per month) of personnel consuming local food, water, or ice could be affected.
- Diarrheal disease of variable severity; may require 1-7 days of supportive care.

Typical Incubation Period: 2 to 3 days (maximum range: 1 to 5 days).

Risk Period: Year-round.

Risk Distribution: Variable; as of March 2001, districts officially reported by the World Health Organization (WHO) as "infected" were Baidoa, Bardera, Belet Uen, Bossaso (11-17-XXN 049-11-XXE), Bur Hakaba (02-47-XXN 044-05-XXE), Johar (02-46-XXN 045-31-XXE), Kismaayo (00-22-XXS 042-32-XXE), Marca, and Mogadishu.

Drug Resistance: Resistance has been reported to the standard therapeutic agents macrolides, tetracyclines, and TMP/SMX.

Surveillance and Survey Data: Between October and December 2000, 272 cases (14 deaths) were reported in Boroma, Awdal region. Vibrio cholerae 01 Ogawa were isolated.

C. Vector-borne Diseases of Greatest Risk

The climate and ecological habitat support large populations of arthropod vectors, including mosquitoes, ticks, and sand flies. Significant disease transmission is sustained year-round and countrywide, including urban areas. Serious diseases may not be recognized or reported due to the lack of surveillance and diagnostic capability.

Malaria is the major vector-borne risk in Somalia, capable of debilitating a high percentage of personnel for up to a week or more. Dengue fever and Rift Valley fever are also major risks in Somalia. In addition, there are a variety of other vector-borne diseases occurring at unknown levels, which as a group constitute a very serious risk comparable to that of malaria. Personnel exposed to mosquitoes, ticks, and sand flies are at high risk during day or night, in both urban and rural areas. The diseases of greatest risk are listed first, in descending order of expected impact.

1. Malaria

Risk Assessment:

- An operationally significant number (as high as 11-50 percent per month) of personnel exposed to mosquitoes could be affected.
- Febrile illness typically requiring 1-7 days of supportive care with subsequent return to duty. Falciparum cases may require intensive care or prolonged convalescence.

Transmission Comments: Relapses or delayed clinical symptoms are common with P. vivax and P. ovale, due to dormant parasite stages (hypnozoites) retained in the liver; delayed P. malariae symptoms may occur due to persistent low-level parasitemia.

Agent/Subtype: P. falciparum; P. malariae; P. ovale; P. vivax.

Typical Incubation Period: 7 to 14 days (maximum range: 7 to 30 days).

Risk Period: Year-round; particularly in southern areas. Risk is elevated during and immediately after the rainy seasons (March through May/June and October through November), particularly in northern and central areas.

Risk Distribution: Countrywide (including urban areas); elevated risk occurs along most riverine habitats, especially in the south.

Vector Ecology: Principal vectors include An. gambiae and An. arabiensis (larval habitats include temporary pools), An. funestus (larvae occur in permanent/ semipermanent bodies of water), and An. merus (larval habitats include brackish water in coastal areas); all four species readily enter dwellings to feed on humans.

Drug Resistance: Falciparum malaria strains are resistant to the standard therapeutic agent chloroquine (likely occurs in all malarious areas; reported from the areas of Mogadishu, Balcad, and Baardheere (02-20-XXN 042-17-XXE). Based on limited data from neighboring Kenya and Ethiopia, resistance also may occur to other standard therapeutic agents, including sulfadoxine/ pyrimethamine (Fansidar), mefloquine, and quinine. Vivax malaria strains resistant to primaquine have been reported. In 1993, a primaquine terminal prophylaxis failure rate of 16 percent occurred among a group of US military personnel returning from the Jubba River area. Additionally, a Belgian Army unit of 68 paracommandos in Somalia in 1993 reported relapses of 6 vivax malaria cases after prophylaxis, indicating resistance to primaquine.

Surveillance and Survey Data: Foci of more intense vivax transmission occur, including the Jubba River Valley (a 24 percent attack rate for vivax malaria was reported among U.S. troops at Jilib along the Jubba River in 1993). Cyclic epidemics of P. falciparum reportedly occur every 3 to 5 years among central and northern area nomads, who lack sufficient exposure to maintain immunity.

Comments: Countrywide, Plasmodium falciparum accounts for 95 percent of reported cases, followed by P. vivax, P. malariae, and P. ovale.

2. Dengue fever

Risk Assessment:

- An operationally significant number (as high as 2-10 percent per month) of personnel exposed to mosquitoes could be affected.
- Febrile illness typically requiring 1-7 days of supportive care with subsequent return to duty.

Typical Incubation Period: 4 to 7 days (maximum range: 3 to 14 days).

Risk Period: Year-round.

Risk Distribution: Countrywide (including urban areas); risk likely exists countrywide but is elevated in the south, associated with increased vector populations.

Vector Ecology: Vectored by Aedes aegypti mosquitoes, a peridomestic, daybiting, container-breeding species.

Surveillance and Survey Data: In 1993, dengue fever was the primary arboviral disease confirmed among U.S. military personnel in southern Somalia (dengue virus serotypes 2 and 3 were isolated). In 1989, a limited survey of residents from Berbera, Woqooyi Galbeed Region, found that 59 percent had antibodies indicative of past infection, with 3 percent having serological evidence of recent infection. Serological results in 1987 suggested dengue 2 as the likely cause of febrile illness outbreaks in 1985, 1986, and 1987 among refugees in the northwest (Hargeysa vicinity).

3. Rift Valley fever

Risk Assessment:

- During irregular peaks of transmission, an operationally significant number (potentially 2-10 percent per month).
- Potentially very severe disease sometimes requiring intensive care; fatalities may occur; convalescence may be prolonged.

Transmission Comments: May also be transmitted through direct contact with infected animals.

Typical Incubation Period: 3 to 12 days.

Risk Period: Year-round.

Risk Distribution: Countrywide (including urban areas).

Vector Ecology: May be transmitted to humans by several species of culicine mosquitoes.

Surveillance and Survey Data: Serologic evidence of past infection with Rift Valley fever was detected in 7 percent of samples from residents of Berbera in 1989.

Outbreak Information: An outbreak late in 1997 and early in 1998 in southern Somalia (Gedo, Hiiraan, and Shabeellaha Hoose Provinces) and northeast Kenya resulted in an estimated 89,000 human cases and hundreds of human deaths. This is thought to be the largest outbreak ever to occur in eastern Africa.

D. Sexually Transmitted Diseases of Potential Risk

This analysis focuses on exposure to commercial sex workers (CSW), a high-risk group for sexually transmitted disease worldwide. The sub-Saharan Africa region has the most widespread HIV/AIDS epidemic in the world, affecting all segments of the population. Heterosexual contact

is the predominant mode of transmission. Carrier rates for hepatitis B are also high. Though the immediate impact of these diseases on an operation is limited, the long-term health impact on individuals is substantial. Gonorrhea, chlamydia, and other infections also are extremely common, and may affect a high percentage of personnel who have sexual contact. Other diseases that often are common in CSWs include chancroid, herpes, lymphogranuloma venereum, syphilis, and venereal warts.

Hepatitis B

Risk Assessment:

- A small number (potentially as high as 1 percent per month) of personnel having unprotected sexual contact (particularly with commercial sex workers) could be affected.
- Typical case requires convalescence over 7 days; chronic infection with liver damage may occur.

Typical Incubation Period: 60 to 90 days (maximum range: 45 to 180 days).
Risk Period: Year-round.
Risk Distribution: Countrywide (including urban areas).
Surveillance and Survey Data: A limited 1995 study found hepatitis B virus carrier rates of 19.1 percent in blood donors, 5.6 percent in hospitalized children, and 21.3 percent in hospitalized adults in Mogadishu. In 1993, surveys of Somalians found the hepatitis B virus (HBV) carrier rate to be between 10 and 27 percent.

E. Animal-contact Diseases of Greatest Risk

Rabies

Risk Assessment:

- Infrequent or sporadic numbers of personnel with direct contact (bites or scratches) with local animals could be affected.
- Very severe illness with near 100 percent fatality rate.

Typical Incubation Period: 21 to 56 days (maximum range: 9 to 180 days).
Risk Period: Year-round.
Risk Distribution: Countrywide (including urban areas).
Surveillance and Survey Data: Reports indicate that rabid dogs frequently attack humans in market areas; several reported attacks in the market places in Mogadishu occurred early in 2001. According to preliminary reports, more than 60 percent of dog/fox bite victims in Shabeellaha Hoose develop rabies and die. In 1998, more than 25 dog bite victims in Qoryoley district (near Mogadishu) developed rabies. Stray dogs likely are the primary reservoir and the main source for human exposure; also likely enzootic in wildlife populations, including hyenas, jackals, and foxes.
Outbreak Information: An outbreak in Mogadishu occurred between January and March 2001 resulting in at least 7 clinical cases; stray dog attacks on humans were reported before the outbreak. Although only 7 clinical cases were reported, other cases likely occurred. Packs of stray dogs have roamed free in the area since 1991 due to uncontrolled chaos.
Comments: Most rabies exposures result in death; rabies vaccine is not routinely available.

CHAPTER V: Yemen Country Study

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SECTION I: HISTORY

Its large, fiercely tribal population affects the Arabian Peninsula states' perception of Yemeni internal stability; it may provide a potential inroad for Islamic extremism in the region. Yemen is officially distancing itself from terrorism. Improving relations with neighbors is its top priority. Yemen desires to join the Gulf Cooperation Council (GCC), but has been blocked due to its support of Iraq during the 1990-91 Gulf War. The recent treaty with Saudi Arabia and improving relationship with Kuwait may reenergize its bid for GCC membership. The government will focus on improving the economy, maintaining a credible military force, and improving intra- and extra-Peninsula relations.

North Yemen. Yemen is one of the oldest centers of civilization in the world, with a history that dates to biblical times. By the 16th century, North Yemen was a nominally independent part of the Ottoman Empire. It had a political structure established by the Shi'a Zaydi sect. Zaydi Imams exercised sovereignty over North Yemen.

At the end of World War I, Turkish forces left North Yemen, and Imam Yahya, leader of the Zaydi community, was able to consolidate his control over the region. After brief military encounters with Saudi Arabia and Britain, which had controlled the port of Aden since 1839, the region's boundaries were agreed by treaty. North Yemen joined the Arab League in 1945 and the United Nations in 1948.

In 1948, Yahya was assassinated during a palace coup, and rebels opposed to his feudal rule briefly seized power. Yahya's son, Ahmed, defeated the rebels and succeeded his father, remaining in power until his death in 1962.

During Ahmed's rule, North Yemen's traditional isolationism faded. In 1958 it joined the United Arab Republic (Egypt and Syria) in forming a federation called the United Arab States, although this was doomed to dissolution in 1961. Pressure placed on North Yemen to play an increasing role in Egyptian President Gamal Abdul Nasser's pan-Arabist movement led to heightened tensions with British colonial rulers who remained dominant in the South.

South Yemen. Aden came under British rule in 1839. In 1937, it was made a crown colony, with East Aden and West Aden being designated protectorates. By 1965, many of the tribal states in the area had joined the British-sponsored Federation of South Arabia.

However, by then strong nationalist sentiments had fostered the emergence of two rival groups: the Front for the Liberation of the Occupied South Yemen (FLOSY), which was supported by North Yemen, and the Marxist National Liberation Front (NLF). These groups turned to terrorism in their efforts to win independence from Britain.

In 1967, British troops began withdrawing and federal rule soon collapsed. The NLF emerged as the stronger of the two nationalist groups and the British Government negotiated independence with the NLF in Geneva. South Arabia was declared independent on 30 November 1967 and renamed the People's Republic of South Yemen.

In November 1989, President Salih of the YAR and Ali Salim Al Baidh, Secretary-General of the YSP, signed an agreement to unify Yemen. A constitution was published before the end of the year, ratified by both countries, and approved by a referendum.

In January 1990, the first meeting of the two Councils of Ministers was held in Sanaa. President Salih held meetings with Saudi Arabia's King Fahd, who gave his cautious blessing to unification. Despite opposition in the North from those who feared an attack on traditional Islamic principles, and in the South from those who wanted to preserve secular freedoms such as the independence of women, formal unification was proclaimed on 22 May 1990.

On 10 May 1994, the Southern forces declared the territory of the former PDRY to be the "Yemen Democratic Republic," and in June the member states of the Gulf Cooperation Council (GCC), with the exception of Qatar, provided their de facto support for the secessionist movement. President Salih accused the Saudis of supporting the Southern Forces on numerous occasions. When the fighting ceased on 7 July, Al Baidh and his remaining ministers fled from Aden to Saudi Arabia.

SECTION II: DEMOGRAPHICS

Population: 17,479,206
Growth rate: 3.36%
Ethnic groups:
Arab 95%
Other 5%
Religion:
Muslim 98%
Other 2%

SECTION III: ECONOMY

Yemen, one of the poorest countries in the Arab world, reported strong growth in the mid-1990s with the onset of oil production, but was harmed by low oil prices in 1998. It continues to be characterized by low levels of domestic industry and an inefficient agricultural sector that necessitates importing almost all essential goods. The southern city of Aden, with its refinery and port facilities, is the economic and commercial capital of Yemen. Future economic development depends heavily on Western-assisted development of the country's moderate oil resources.

Yemen has embarked on an IMF-supported structural adjustment program designed to modernize and streamline the economy, which has led to foreign debt relief and restructuring. Aided by higher oil prices in 1999, Yemen worked to maintain tight control over spending and implement additional components of the IMF program. The high population growth rate of 3.36 percent and internal political dissension complicate the government's task. Sanaa is the political capital of a united Yemen, while Aden, with its refinery and port facilities, is the economic and commercial capital. The low level of domestic industry and agriculture has made northern Yemen dependent on imports for practically all of its essential needs. Land once used for export crops (cotton, fruit, and vegetables) is used to grow qat; qat leaves are chewed for their stimulant effect. Economic growth in southern Yemen has been constrained by a lack of incentives, centralized control over production decisions, investment allocation, and import choices. The border agreement with Saudi Arabia and the cooperation agreements signed with Qatar may help ease Yemen's economic burden through increased employment opportunities for Yemenis outside the country.

A. Statistics

GDP (billion) (1999): $12.7
Growth rate (1999): 4%
Per capita (1999): $750
Inflation rate (1999): 10%
Unemployment rate (1999): 30%
Revenues: US$3.8 billion; **Expenditures:** US$4.8 billion
Exports: Japan, Germany, Italy, Saudi Arabia, France
Major Exports: Crude oil, cotton, coffee, dried fish
Major imports: Textiles, sugar, grain, machinery, chemicals, cement.
Agriculture: Grain, fruits, qat (narcotic herb), coffee, fish, livestock
Exports (billion) (1999): $2.0
Imports (billion) (1999): $2.3

Since unification in May 1990, there has been little economic information about the new national economy. At unification, the PDRY had a centrally controlled Marxist economy, while the YAR was market-oriented. The newly unified government has been trying to integrate these two disparate systems during the transitional period.

Since unification, Yemen has relied heavily on foreign aid to sustain its weakened economy. This tact was substantially weakened by the political support Yemen provided to Iraq during the Gulf crisis. Saudi Arabia, Yemen's largest contributor of foreign aid, cut off all aid payments and compelled an estimated 850,000 Yemeni workers to return to Yemen. The resultant economic dislocation caused an estimated US$2 billion loss to the national economy.

B. Resources

Yemen's natural resources are petroleum, fish, rock salt, marble, small deposits of coal, gold, lead, nickel, and copper. Oil has only recently been discovered; consequently, its potential has not yet been fully realized. Reserve figures are thought to be underestimated by a substantial amount, but until Yemen resolves external and internal political problems and encourages foreign investment, the true figures will not be known. Even before unification, the former YAR was exporting oil, increasing exports by some US$750 million. Once the reserves of the former PDRY – at least twice those of the YAR – are tapped, Yemen should start reaping substantial rewards.

Gas has also been discovered – enough for export as well as domestic use. Again, reserve estimates are believed to be underestimated. Yemen is adjusting to the use of gas as an energy source by building gas-powered electricity generation stations and gas-bottling plants.

As with most Middle Eastern states, the issue of fresh water is paramount in Yemen. The government is investing money in an attempt to ensure a regular fresh water supply. Presumably looking to the mountains and hills, the government may attempt to tap natural ground water from the mountains as one source. Most of this water would go towards agricultural needs.

SECTION IV: CLIMATE AND GEOGRAPHY

A. Climate

Yemen forms the southwestern corner of the Arabian Peninsula, with the Red Sea to the west and the Gulf of Aden to the south, having an area roughly twice the size of Wyoming. Generally, temperatures are hot, ranging from a low of 71°F (22°C) to a high of 99°F (37°C). On the coast and desert plains, conditions are generally hot and humid for most of the year, with very little rain. This is especially true of the southern coast.

The Al Jahal mountains in northwest Yemen receive substantially more rain – often over 60 centimeters (23 inches) a year, falling mostly between March and September – and have lower temperatures, making the climate mild in winter and warm and moist during summer. Because of its location with respect to the equator (15° N), Yemen is a desert, warm and dry with mostly clear skies. The overall desert climate, however, can be separated into three major climate sub-regions based upon topography. Dominated by sand, gravel, and lava-covered open spaces, the first topographical climate sub-region is the narrow plain that lies along the coast. The width of the plain varies, but averages 20-25 nautical miles (NM). The second major climate sub-region is the Yemen highlands, covering the majority of the country away from the coast. The highlands consist of rugged mountains that dominate the west, along with a large inland region stretching eastward through high plateaus, mountains, and foothills. Finally, the far northeastern portion of the country is the third climate sub-region. Here an extraordinarily hot, harsh desert plain slopes into the desert interior of the Arabian Peninsula.

Weather on the low coastal plain is relatively constant year-round: hot, humid, mostly clear skies, and very little rainfall. The immediate coastline to 2 NM inland stays cooler than the rest of the coastal plain because of the moderating influence of sea surface temperatures. Morning fog occasionally forms on the immediate coast. Away from the coast, the highlands are markedly cooler than the coastal plain. The highlands also have more variable cloud cover and precipitation throughout the year. This is because of the lifting of moisture from the sea, pushed up against the mountains by seasonal air patterns, or by daily sea breeze patterns. (A sea breeze is a daily occurrence where the difference in heating between land and water causes a persistent onshore wind at 6-10 knots, normally from mid-morning to early afternoon.) The upland desert plain in the northeast is almost uniformly hot, harsh, and desiccated.

Seasonal variations in Yemen weather follow a monsoon climate pattern. A monsoon climate is defined by a definite shift in the direction of the prevailing wind from one season to the next. Seasons are named for the direction from which the monsoon wind blows, shifting by 120 degrees or more between seasons. The Yemen winter is the time of the northeast monsoon (known locally as “Gilal”) occurring December through March. The Yemen summer is the time of the southwest monsoon (“Hagai”), occurring June through September. Two short transition periods separate the monsoon seasons. The spring transition (“Gu”) occurs April through May, and the fall transition (“Der”) occurs October through November.

A large-scale weather feature known as the near equatorial trough (NET), or monsoon trough, also affects Yemen weather. The NET stretches west to east across Africa and the Arabian Peninsula, and migrates north and south on a somewhat predictable timetable throughout the year, northward in the spring and southward in the fall. In Yemen, the NET usually migrates overhead only during the southwest monsoon (summer). For this reason, summer is the only time Yemen receives any measurable rainfall, and this is primarily in the highlands.

1. Northeast Monsoon Season (December through March)

All seasons in the narrow coastal plain have a preponderance of fair skies and little precipitation. However, there are more clouds in the coastal areas during the winter/northeast monsoon season than at any other time of year. Overnight, low cloud ceilings sometimes form below 3,000 feet (915 meters) from late evening to mid-morning. Very little rain falls. Though this is the coolest time of the year, daily winter highs in coastal areas are still warm, in the mid-80's Fahrenheit, with daily lows ranging from the upper 60's to the low 70's Fahrenheit.

Higher elevation winter weather is relatively mild. Over the foothills where inland mountains face the coast, clouds are likely to form between 0900 and 1800 local standard time (LST). Sea breezes also produce occasional rain showers and thunderstorms along the mountains. In the inland highlands, clear skies are common with undisturbed weather. Isolated showers and thunderstorms can occur when Mediterranean cold fronts reach the area. By December a cold front crosses the area every 5-10 days, bringing light precipitation and increased mid- and upper-level clouds. Significant precipitation is relatively rare in winter, but the highest elevations receive the most. Precipitation in the form of snow falls above 10,000 feet (3,050 meters), but accumulations of 6 inches are rare. Depending on elevation, daily winter high temperatures in the highlands are generally in the 60's and 70's Fahrenheit, with daily lows ranging from the 40's to the 60's Fahrenheit. Sanaa has dropped to 22° Fahrenheit in December.

2. Spring Transition Season (April through May)

During the spring transition, coastal areas remain hot, humid, and dry. Mid-afternoon fair weather cumulus clouds are not uncommon. Very little rain falls. Springtime high temperatures along the coast are in the upper 80’s to low 90’s Fahrenheit, with lows generally in the upper 70’s to lower 80’s Fahrenheit.

Higher elevation weather during spring transition shows an increasing likelihood for clouds and showers on the western slopes and a decreasing frequency of clouds and showers on the eastern slopes from April to May. Spring highland high temperatures are generally in the 70’s and 80’s Fahrenheit, with lows ranging from the 40’s to the 70’s Fahrenheit, depending on elevation.

3. Southwest Monsoon Season (June through September)

During the summer/southwest monsoon, coastal areas are very hot, humid, and dry. Strong daytime sea breezes produce fair weather cumulus clouds on the immediate coastline. Two areas of the coast require more detailed discussion. There is an increased likelihood of thunderstorms with light rain after midnight north of the city of Aden toward the mountains. On the immediate coast east of Riyan toward Ras Fartak, spotty early morning drizzle is possible because of strong upwelling of cool ocean water in this section. Summer high temperatures along the coast are in the 90's Fahrenheit, with lows generally near 80° Fahrenheit.

In the highlands, a well-defined diurnal cloud and precipitation pattern forms west to east across the Yemen and Asir Mountains. The arrival and orientation of the NET in summer causes hot, dry, and cloud-free skies to dominate eastern slopes, while substantial rainfall and cooler daytime temperatures dominate western slopes. This feature of the western slopes is caused by the influence of sea breeze circulation. On the western slopes, afternoon sea breezes cause frequent and significant cloudiness, rain showers, and embedded thunderstorms. Rainfall often

occurs between 1400 and 1800 LST. Clouds generally dissipate after midnight and skies are generally clear in the early morning. Summer highland high temperatures vary widely with elevation and location. June is generally the warmest summer month, with daily highs diminishing through September.

4. Fall Transition Season (October through November)

During the fall transition, coastal areas remain hot, humid, and dry. Cloud cover is minimal, with mid-afternoon sea breeze cumulus typically the extent of cloudiness. Fall high temperatures along the coast are in the upper 80's Fahrenheit, with lows generally in the mid 70's Fahrenheit.

As the NET recedes southward, the fall transition season in the highlands is the driest period of the year. Most places average less than an inch of precipitation for the entire two month fall season. Cloudiness is also minimal. Fall highland high temperatures are generally in the 70's Fahrenheit, with lows ranging from the 40's to the 60's Fahrenheit, depending on elevation.

5. Special Weather Considerations

a. Visibility: Visibility along the coastal plain in Yemen is mainly affected when strong daytime sea breezes raise sand and dust. Year-round, however, visibilities are above 3 miles more than 95 percent of the time. During the dryness of the southwest/summer monsoon, a thin haze is common, with visibilities of 4-7 miles. Also during the summer, early morning fog and stratus are obstructions to vision east of Riyan. Extensive thin fog may persist along the water and immediate coastline until 1600-1700 LST. In the highlands, visibility is generally excellent. Isolated locations may see morning ground fog, and strong winds can cause reduced visibility because of dust. During summer, local heat-induced dust storms are possible.

b. Synoptic Weather Patterns: Effects of frontal weather (e.g., a cold front) are minimal in Yemen. Wintertime cold fronts push southward into the highlands of Yemen, but are generally weak and short lived. Tropical cyclones (known as hurricanes or tropical storms in the northern Atlantic Ocean) pose little danger to Yemen.

c. Flying Weather: Flying weather is generally good in Yemen. Ceilings less than 1,500 feet (450 meters) are restricted to summer, and occur less than 20 percent of the time in the highlands and on the coast. Visibility less than 3 miles (8,000 meters) is infrequent, and occurs mainly in the summer because of blowing dust.

d. Reconnaissance Weather: The weather in Yemen is generally good for reconnaissance because of generally clear skies. Conditions may briefly worsen in blowing dust/sand and during rainshower/thunderstorm activity.

B. Geography

1. Boundaries: Yemen contains 527,970 square kilometers (205,908 square miles) and is slightly larger than twice the size of Wyoming. To the north, Yemen is bordered by Saudi Arabia (a border of 1,458 kilometers [904 miles]), to the east by Oman (288 kilometers [179 miles]), to

the west by the Red Sea, and to the south by the Gulf of Aden. Yemen claims 12 nautical miles for territorial waters, a contiguous zone of 18 nautical miles, and a 200-nautical mile exclusive economic zone. Yemen disputes the undefined section of boundary with Saudi Arabia. The treaty with Oman to settle the Yemeni-Omani boundary was ratified in December 1992.

2. Topography: The terrain is diverse, with flat, dry, coastal plains and soaring mountains in the interior. The Tihama, a hot, sandy, semi-desert strip about 64 kilometers (40 miles) wide, separates the Red Sea coast from the generally less arid mountainous area of the interior. The mountains, heavily terraced for agriculture, reach heights of 3,658 meters (12,000 feet) above sea level. A normally sufficient rainfall and agreeable mountain climate make the area one of the most important agricultural areas of the Arabian Peninsula.

SECTION V: TRANSPORTATION AND COMMUNICATIONS

A. Transportation

1. Roads: Yemen has over 4,000 kilometers (2,480 miles) of surfaced road; a good road network exists in the former Yemen Arab Republic (YAR) that links most towns and villages. Other roads have a natural surface, but are of reasonable quality. There are roads that link with those of the former People's Democratic Republic of Yemen (PDRY), but these decline in quality. The former PDRY's road network is extensive only in the southeast.

2. Railroads: Yemen does not have a railway network.

3. Ports: Yemen's primary port is Aden. It played a significant role for ships passing through the Suez Canal until its closure in 1967; since its re-opening in 1975, it has not regained its former glory. However, it is currently undergoing an extensive development project in an effort to increase its capability. Aden has a 244-meter (800-foot) cargo wharf that can take ships 91 meters (300 feet) long with a 5.5 meter (18 foot) draft, as well as 24 first-class berths and an oil harbor that can handle four 57,900-ton tankers of up to 12-meter (40-foot) draft. Floating cranes, mobile cranes, and numerous forklifts are available.

The port can handle tankers as well as roll-on/roll-off (RO/RO) and container cargos. The port has facilities for ship repairs. Khormaksar Airport is located 8 kilometers (5 miles) from the seaport. Al Hodeidah is located 215 kilometers (133 miles) north of the Bab al Mendeb along the Red Sea coast. It has an anchorage point of 10 meters (33 feet) deep. The approach to the anchorage is through a 16.5-kilometer (10-mile) long channel that is 10 meters (33 feet) deep. The port can handle container, tanker, bulk cargo, and RO/RO vessels. Hodeidha airport is 7 kilometers (4 miles) from the seaport.

Other Yemeni ports include Al Mukalla, Al Mocha, Nashtoun, and Al Salif. Both Nashtoun and Al Salif are newly constructed, and the Yemeni government has high hopes that they will play important roles in the fishing and mineral salt industries, respectively. Two other ports, Ras Issa and Bir Ali, are becoming increasingly important to Yemen's economy, since they are primarily involved in the export of crude oil. Al Hodeidah, Al Mocha, Al Salif, and Ras Issa are located on the Red Sea, while the others are located on the Arabian Sea.

4. Air: Following unification, Yemen's two national airlines – Yemenia and Alyemda – were merged, despite a disagreement between the Saudi government and the Yemeni government

over Saudi Arabia's partial ownership of Yemenia (the airline of the former YAR). The governments of Saudi Arabia and Yemen jointly own Yemenia. Fleet details are as follows:

Boeing 727-200	8
Boeing 727-300	3
Boeing 727-320	2
Dash 7	4
L-382C	2
Tupolev 154	1

B. Communications

1. Radio Stations: There are five radio broadcast stations: four AM and one FM. All radio broadcasts are in Arabic. Personal shortwave receiver is the only way to ensure Voice of America reception.

2. Television Stations: There are 10 TV broadcast stations. All programs are broadcast in Arabic, with the exception of a 7:30 p.m. news show, which is broadcast in English.

3. Telephones: The central telephone office is located in Sanaa opposite the Chinese Embassy. International calls can be made for 150 riyals to nearly all countries.

4. Newspapers and Magazines: There are more newspapers published in Yemen than in any other Arab state. The English language *Yemen Times, The Middle East Times,* and *Arab News* are available and widely praised as an example of the freedom of the press. *Time* and *Newsweek* are also widely available.

SECTION VI: CULTURE

A. Population Patterns and Divisions

The official population of Yemen is estimated at 17 million people. The bulk of it is concentrated in the north. Most of Yemen's inhabitants live in rural areas; only 24 percent of the people live in urban centers. In contrast with the nomadic traditions of other Arabian Peninsula inhabitants, Yemenis have long been settled in small agricultural communities.

B. Ethnic/Cultural Divisions

Yemenis are characterized as Semitic, with African ties common, especially in the Tihama coastal strip. Many Yemenis have close family ties in Ethiopia, Somalia, and Djibouti. Yemenis are proud of their ancient culture and history, and regard their distinctive civilization as a unifying force among the many tribes that make up the population. In spite of this, numerous issues divide the population and prevent Yemen from emerging from underdevelopment.

1. Regional: Regional differences have caused the greatest rift among Yemen's population. Deep feelings of mistrust and resentment still exist between northern and southern Yemenis following the 1994 civil war. Additionally, the Hawdramaut region in eastern Yemen has long been isolated from the major power centers of Aden and Sanaa and, consequently, has developed its own conservative and deeply religious culture. The Tihama region, along Yemen's northwestern coast, is culturally different from the rest of northern Yemen. The Tiahma has more ethnic and cultural ties to Africa than to South Arabia, resulting in a dramatic contrast between the inhabitants of the Tihama and inland Yemen.

2. Tribal: Tribal differences also add to the schism within the population. Northern Yemen is dominated by tribes and tribalism, which many urban Yemenis (particularly in the south) regard as backwards and primitive. The tribes have often been in conflict with one another, but more recently have begun to band together for mutual support against the central government. The tribes see the government as threatening tribal autonomy as well as traditional life and values.

Tribes have been a basic element of the social structure of Yemen for thousands of years, and remain important even today. Tribal affiliation is especially important for those in the north, which comprises nearly two-thirds of the population. However, great regional differences exist even within the tribal community. The different origins of the southern and the northern groups were of great political importance in the first centuries of the Islamic age, and have not been forgotten to the present day. In many parts of Yemen, it is not uncommon to see men from the tribes heavily armed. The tribes rather than the central government likely own armored cars seen in certain areas. All these weapons are used in feuds, skirmishes, and tribal conflicts outside the control of the government in Sanaa.

At its simplest level, the tribe is a political unit based on a particular region. It has fixed borders, a known number of members at any one time, and a certain amount of political autonomy with which it interacts with other tribes and with the central government. Almost all the tribes in Yemen now lead settled lives. Most subsist on agriculture, planting their fields either with grain, such as sorghum, millet, wheat or maize, for their own use or with cash crops, such as coffee, bananas, or grapes, for the market. Some members earn their living as craftsmen.

One reason why tribal structures have survived so long in Yemen is their flexibility. Over the last 1,400 years, since the rise of Islam, nations have arisen and disappeared again. Yemeni tribes were incorporated in these nations, but remained responsible for the administration of their tribal areas. In those periods when central authority crumbled and fell apart, tribes ensured the survival of social order by their traditions and laws.

3. Religious: Religious differences also divide the population. Northern Yemen is predominantly Zaydi Muslim, a smaller sect of Shia Islam also called “Fivers” for their acceptance of only the first five Imams after Hussein’s death. Southern Yemen is predominantly Shafa’i Sunni Muslim. While religious differences are not openly acknowledged as divisive, the conservative nature of the Zaydis in the north has caused resentment among many southern Yemenis, who feel the Zaydis have no right to force their brand of morality on the south. In the north, the inhabitants of the Tihama region are mainly Sunni or non-Zaydi Shia, and many women in the region go about unveiled.

C. Yemeni Society

1. Education: A low level of education continues to plague development of the state; however, the number of students has greatly expanded in recent years. Primary education begins at age 6 and lasts for 6 years. Secondary education, beginning at age 12, lasts for another 6 years. As a proportion of the school-age population, the total enrollment at primary and secondary schools was 56 percent (85 percent males, 25 percent females). There is a university in Sanaa and over 20 technical and vocational institutes spread throughout the country.

2. Recreation: While the current internal security situation may prohibit U.S. military personnel from engaging in tourist activities, Yemen does have a rich heritage and offers vast opportunities for travel and exploration. In the silver markets of Sanaa, antique and old-looking metalwares are sold. The souq is open daily but is best visited in the morning, when activity peaks, or between 1800 and 1900. The most imposing sight in Sanaa is the old city, especially the eastern part. Many of the houses are more than 400 years old and all are built in the same unique style of 1,000 years ago. The walled city is one of the largest completely preserved ancient cities in the Arab world. On the southeastern tip of the walled city, the old citadel stands on a hill. It is used by the military and may not be entered.

3. Customs and Courtesies

a. Rules of Etiquette:

- It is important to sit properly. Slouching, draping legs over the arm of a chair, or otherwise sitting carelessly when talking with someone communicates a lack of respect for that person.
- Legs are never crossed on top of a desk or table when talking with someone.
- When standing in conversation with someone, leaning against a wall or keeping the hands in pockets is taken as a lack of respect.
- Sitting in a manner that allows the soles of one's shoe to face another person is a very serious insult.
- One should always sit with both feet on the floor.
- Failure to shake hands when meeting someone or saying good-bye is considered rude. When a Western man is introduced to an Arab woman, it is the woman's choice whether to shake hands or not; she should be allowed to make the first move.
- One who lights up a cigarette in a group must be prepared to offer cigarettes to everyone.
- Men stand when a woman enters the room; everyone stands when new guests arrive at a social gathering and when an elderly or high-ranking person arrives or departs.
- Men allow women to precede them through doorways, and men offer their seats to women if none are available.
- If guests admire something small and portable, an Arab may insist that it be taken as a gift. Guests need to be careful about expressing admiration for small, expensive possessions.
- Gifts are given and accepted with both hands and are not opened in the presence of the donor.

- When eating with Arabs, especially when taking food from communal dishes, the left hand is not used. (The left hand is considered unclean.)
- At a restaurant, Arabs will almost always insist on paying, especially if there are not many people in the party or if it is a business-related occasion. Giving in graciously after a ritual gesture to pay and then returning the favor later is an appropriate response.
- People, especially women, should not be photographed without their permission.
- Most Arabs do not like to touch or be in the presence of household animals, especially dogs. Pets should be kept out of sight when Arab guests are present.

b. Dress Standards: The Koran calls for both women and men to dress modestly. Foreigners traveling in Muslin (especially Arab Muslim) countries must be aware of the cultural and religious dress standards expected of both locals and visiting foreigners. While Yemen is not as restrictive as Saudi Arabia with regard to acceptable dress standards, it is best to err on the side of caution. For men, long-sleeve, collared shirts with slacks are the norm. For women, long dresses that cover the entire leg are advisable. Long-sleeve, high-neck blouses are also recommended. A woman may carry a scarf or shawl to quickly cover her head and shoulders, should she find herself in the presence of more conservative local Arabs. Casual dress at social events, many of which call for formal dress (suit and tie for men, dress and high heels for women), may be taken as a lack of respect for the host.

c. Eating/Drinking: Yemeni restaurants are not places of social interaction. Lunch is the main meal of the day. In lieu of utensils, fingers of the right hand and a piece of bread are used. Bottled water and soft drinks are widely available. Never drink water from the standard plastic jugs in restaurants. Alcohol is banned, but there is a large trade in smuggled liquor. U.S. personnel are advised to avoid consumption of alcohol due to potential legal complications.

CHAPTER VI: Philippines Country Study

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SECTION I: CULTURE

The Philippines is a family-oriented society. Scholars have noted that from their very earliest socialization, Filipinos are taught not to think of themselves, but to think of the family, the barangay, and the town. In addition, the ethnic diversity of the country reinforces this introverted process. Thus, it is more common for the citizenry to think not in terms of a nation of Filipinos, but in terms of representatives of towns, districts, and ethnic backgrounds. In addition to the family, the Catholic Church is a dominant influence. Most importantly, the Church has instilled in the people a sense of patience, a conviction that this life is merely preparation for a more glorious life to come. This outlook contributes to popular acceptance of the economic and social imbalances that exist in the country. Some six million Filipinos make up the so-called cultural minority groups or tribal Filipinos – a minority which nevertheless comprises 12 percent of the total population. Included in this are four million Muslims.

In the Philippines, the stability of family and community takes precedence over personal desires. The subsistence economy also helps to dictate the authoritarian structure of the family in which control can be enforced at any level of seniority. In Philippine society, self-esteem becomes equated with stature, and one's position in the social order, regardless of actual function, is of major importance. Control is asserted less by physical resistance or punishment than by a sense of public shame or, in extreme cases, by ostracism. Either of these controls is more effective than any appeal to guilt feelings. The pressure of obligatory relations is summed up in the concept of reciprocity. The chief exception to hierarchical structure in the family is the Philippine wife, who is legally her husband's equal. Today, women hold national public office and executive and professional positions at all levels of society.

The Philippine class structure has been remarkably unchanged throughout the centuries. Of the total population in 1992, it is estimated that about 1 percent is considered in the upper class (large landowners, highly successful professionals and businessmen, and upper echelon government officials); 12 percent in the middle class (minor officials, certain educators, most businessmen, and owners of medium size farms); 32 percent in the upper lower class (skilled laborers, government clerks, most teachers and office workers, owners of small farms and general stores); and 55 percent in the lower class (unskilled laborers, owners of less than 5 acres of farmland, most tenant farmers, landless farm laborers, the handicapped, and most household servants).

A. Ethnicity

Philippine society is relatively homogeneous, especially considering its distribution over some 7,100 islands. Muslim and upland tribal peoples represent the most obvious exceptions, while approximately 90 percent of the society remains united by a common cultural and religious background and ethnically referred to as Lowland Christians.

The people of the Philippines are called Filipinos. According to some anthropologists, the Philippine Islands have 45 ethnographic groups distinct in economic and social life, language, and often-physical type. Among physical groups, the Visayans (also called Bisayans), who inhabit the sugar rich central islands, constitute the most numerous divisions. They are usually subdivided into three groups: the Cebuano in the center, Samar-Leyte in the east, and Hiligaynon in Panay and Western Negros. The Visayans are characterized as being the most carefree and the most Spanish in their music and folkways.

In Luzon, the Tagalogs, from the provinces adjacent to Manila, are the most home-loving and learned of Filipinos; the Ilocanos, from the north, the most energetic, thrifty, and migratory; and the Pampanguenos, from the central plains, the sharpest in trading. The Muslims of the far southern islands are considered the most independent Filipinos.

The Muslims, also referred to as Moros, are the largest of the organized non-Christian minorities, constituting approximately 4 percent of the population. There are many Muslim groups, each with distinct cultural and linguistic habits. The three main groups are the Tausog, Maranaw, and Magindanaw. Other non-Christian groups, also referred to as Upland Tribal Groups, adhere to indigenous religious beliefs and practices. The mountain people of northern Luzon include the Ifugaos, Bontocs, Benguets, Kalingas, and Apayaos. Nomadic Ilongots roam the range of eastern Luzon. The Mangyans of Mindoro and the Manobos, Bukidons, and Bagobos of Mindanao all practice slash-and-burn cultivation. The non-Christian minorities have been treated as marginal Filipinos. Adequate political representation has not yet been extended to all of these groups. They have been less successfully assimilated by intermarriage than have the Chinese, Spanish, and American mestizos, or mixed groups.

The Chinese have managed the economy as financiers and entrepreneurs, but they are not naturalized citizens. Contacts with China from the 10th century on have resulted in a group of mixed Filipino-Chinese descent, which accounts for a minority of the population. Spanish-Filipinos and Filipino-Americans may be distinguished by their fairer complexion, taller stature, and aquiline nose structure.

B. Religion

Roman Catholicism is the dominant religion in the Philippines. It is the religion of about 83 percent of the population. Although the Philippine Constitution calls for separation of church and state, the Catholic Church is still able to manipulate some government policy decisions. Islam pre-dates Catholicism by about three centuries, but has remained confined to the Sulu Archipelago and the provinces of Mindanao. Approximately 5 percent of the population practices the Muslim religion. Protestantism, also a minor religion in the Philippines, is practiced by approximately 9 percent of the population. Another 3 percent of the population follows Buddhism and other minor religions.

C. Education

The formal education system in the Philippines offers six years of elementary instruction followed by four years of high school. In 1975, only 21.7 percent of Filipinos who were 25 years or older had completed elementary school. Recently, however, 61.5 percent of the eligible population now completes elementary school, and approximately 30 percent of the eligible population now attends high school. Ninety percent of males and females over age 15 can read and write. Elementary education begins at 7 years of age and is provided free of charge at public (government-administered) schools.

Secondary education, which is also available free in some areas, begins at the age of 13 and lasts for up to four years, comprising two equal cycles. There is a common general curriculum for all students in the first two years and more varied curricula in the third and fourth years, leading to either college or technical vocational courses. In 1988, 98 percent of all children in the relevant age group were enrolled at primary schools, while the comparable ratio for secondary enrollment was 54 percent. The total enrollment at elementary schools in 1989-90

was 10.3 million, while secondary school enrolment was 4.0 million. Instruction is in both English and Filipino at the elementary level, while English is the usual medium at the secondary and tertiary levels. In 1989, a new curriculum for secondary schools was implemented; Filipino was to be the language of instruction for all subjects except mathematics and sciences. Among the population aged 15 and over, the average illiteracy rate in 1990 was estimated at 10.3 percent (males 10.0 percent, females 10.5 percent). The 1991 budget allocated 39 billion pesos (15.5 percent of total expenditure) to education, culture, and training.

D. Important Tips

The Philippines has been influenced by the Chinese, Malayan, Spanish, and American cultures. Consequently, many aspects of these different cultures are evident in the unique Filipino society. Although casual and fun loving, Filipinos are sensitive people; insincerity is easily detected and can ruin a relationship. Individualism is less important than the family. Bringing shame to an individual reflects on his family and is avoided at all costs. Interdependence is more important than independence; a family member will often sacrifice personal goals or desires to help the family or another family member. Likewise, making social relationships run smoothly is often seen as being more important than expressing personal views. A Filipino may even consider frankness to show a lack of culture. In general, Filipinos have a more relaxed view of time and may not always begin meetings or appointments promptly.

Accepting a favor obliges a Filipino to repay with a greater favor, although never with money. Innovation, change, and even competition are sometimes considered risks that could bring shame if a person fails. Making changes in social or religious habits may be considered as being ungrateful to parents. Fatalism is a common attitude, characterized by the expression Bahala na, which means, roughly, "Accept what comes and bear it with hope and patience." Success may also be attributed to fate rather than ability or effort. The Latin idea of machismo is evident in the Philippines; the ideal man is a macho man. Men often make comments about women passing by on the street, but these are ignored.

SECTION II: GEOGRAPHY

The Philippines is one of few developing nations in the world with a functioning democracy. The Philippines also enjoys moderate economic growth, balanced between technology exports, manufacturing, agriculture, and services. An Archipelago nation of over 7,700 islands, the Philippine economy is enhanced by its location near major international shipping lanes, but also limited by transportation difficulties and its vulnerability to hurricanes and volcanic activity. Communist insurgent groups in the central and northern islands and Muslim secessionist groups in the southernmost islands affect Philippine internal stability. The Philippines has few external threats, the most significant being PRC encroachment upon its territorial and maritime claims in the South China Sea.

A. Summary Data

Total area: 300,000 sq km; land area: 298,170 sq km
Comparative area: Slightly larger than Arizona
Land boundary: None
Coastline: 36,289 km

Maritime claims: 200 NM exclusive economic zone
Disputes: Involved in a complex dispute over the Spratly Islands with China, Malaysia, Taiwan, Vietnam, and possibly Brunei; claims Malaysian state of Sabah.
Natural resources: Timber, petroleum, nickel, cobalt, silver, gold, salt, and copper.
Land use: arable land 26%, permanent crops 11%, meadows and pastures 4%, forest and woodland 40%, other 19%.
Irrigated land: 16,200 sq km (1989 estimate)
Environment: Astride typhoon belt, usually affected by 15 and struck by five to six cyclonic storms per year; subject to landslides, active volcanoes, destructive earthquakes, tsunami, deforestation, soil erosion, water pollution.

B. Terrain

The Philippines officially consists of 7,107 islands of which only 2,000 are inhabited. Only about 500 of the islands are larger than a square kilometer, and 2,500 of them are not even named. In order of size, the biggest islands are:

Luzon	104,683 sq km	Negros	9,225 sq km
Mindanao	94,596 sq km	Leyte	6,268 sq km
Palawan	14,896 sq km	Cebu	5,068 sq km
Panay	12,327 sq km	Bohol	4,117 sq km
Mindoro	10,245 sq km	Masbate	4,047 sq km
Samar	9,949 sq km		

The total area of the Philippines is 300,000 square kilometers. From north to south the Philippines stretch for 1,850kmand from east to west for 1,100km. The highest mountain is Mt Apo, near Davao in Mindanao, at 2953 meters. Mt Pulong, east of Baguio in north Luzon, is the second highest at 2,930 meters. There are over 37 volcanoes in the Philippines, 17 of which are classified as being active, including the Mayon Volcano near Legaspi in south Luzon. The longest rivers are the Cagayan River, the Rio Grande de Pampanga, and the Agno in Luzon; and the Rio Grande de Mindanao and the Agusan River in Mindanao.

The islands of the Philippines can be conveniently divided into four groups:

- Luzon, the largest and northern most island and the site of the capital, Manila. The nearby islands of Mindoro and Marinduque, which are sandwiched between Mindoro and Luzon, are generally included with Luzon.
- The island of Mindanao and the Sulu Archipelago, which dominates the southern portion of the archipelago.
- The tightly packed island group known as the Visayas, which fills the space between Luzon and Mindanao. There are seven major islands in this group: Panay, Negros, Cebu, Bohol, Leyte, Samar, and Masbate. Cebu is the central island of the group and Cebu City is the shipping center for the entire Philippines. From here ships run to places throughout the country.
- The province of Palawan off to the west, which is dominated by the island of Palawan, but also includes more than 1,700 other islands.

SECTION III: CLIMATE

The climate in the Philippines is typically tropical – hot and humid year round. Although the actual weather pattern is fairly complex, it can roughly be divided into January to June (dry) and July to December (wet). January is usually the coolest month and May the hottest, but the temperature does not fluctuate far from 25°C (80°F) year round.

December to February are the "cool dry" months, while March to May are the "hot dry" months. It rains nearly every day from July through September. In May, Manila usually has daytime temperatures of 35-40ºC (65º-104ºF), and at night it does not drop much below 27ºC (81ºF). This is the time of year when rich citizens of Manila head for the perpetual spring of Baguio and the mountain provinces.

The best time to travel is from December to May. In December and January, however, you must contend with the rains on the east coast. March through May are the summer months. Normally, for large areas of the Philippines, the rainy season starts in June. However, over the past decade, the dry season has occasionally extended into July.

Travel around the Philippines is not really affected by the occasional downpour, but more by the unpredictable typhoons that usually come with the wet, monsoon season from May to November. The southwest Visayas and Mindanao lie beneath the typhoon belt. Typhoons usually blow in from the southeast.

The Pacific Ocean coastline, comprising Luzon, Samar, Leyte, and Mindanao, lies in the path of the northeast trade winds, ensuring a mild oceanic climate. The winter monsoons take place from December or January to May and bring rain to the Pacific coast, but primarily dry pleasant weather to the rest of the land. The summer monsoon blows from June to December or January and brings heavy rains to the Manila area. The typhoons in the Pacific region are predominantly in the Marshall and Caroline Islands. They travel in a northwesterly direction towards the Chinese mainland between June and November, mainly in August/September.

SECTION IV: TRANSPORTATION AND COMMUNICATIONS

A. Transportation

1. Buses: Inexpensive bus service is available throughout most large cities and suburbs. Although schedules are frequent, Philippine buses are considered unsafe and uncomfortable by U.S. standards. Pick pocketing is quite common on buses, and bus drivers often drive recklessly. Both local and long distance buses announce only the final destination. Depending on the distance, the trip costs 90 centavos for the first five kilometers, then 25 centavos for every further kilometer. In Manila the air-conditioned bus is very popular, but more expensive.

2. Jeepneys: These are the most popular means of transport for short journeys. The jeepneys are reconstructed Jeeps which were left in the Philippines by the U.S. military after World War II. They are colorfully painted, and the tops are decorated with a multitude of mirrors and statues. Most jeepney routes are prescribed, and the fares start at 90 centavos for the first five kilometers, then 25 centavos for every kilometer thereafter. When you want to get off, just bang on the roof, hiss, or yell "Jeepney para."

Outside of urban areas, it is important to negotiate a price before setting out on a long trip over unfamiliar territory. Before you start, ask other passengers about the price, or check in a nearby shop and then confirm the price with the driver. This may save you an unpleasant

situation upon reaching your destination. Jeepneys usually only leave when full (or overflowing) with passengers; therefore, you must allow for long waiting periods. If you climb into an empty jeepney and the driver takes off immediately, it means he usually will try to charge you for a "special ride." If you do not want this, you must make it clear to him that you are only prepared to pay for a "regular ride." It costs about P600 to rent a jeepney for a day, more if the roads are in bad condition, and gas is extra.

Safety Tip: If several men get into the jeepney after you and try to sit near you or get you to change seats, get out immediately. They may be trying to rob you.

3. Taxis: Taxis have meters, or they are supposed to. Flat-fare arrangements will always work out to the driver's advantage, although some meters turn over more quickly than normal. In spite of fines of up to P5000, countless taxis still have rigged meters. Pay particular attention to the digital price display if the driver honks the horn every few seconds. Sometimes horns and meters are linked up and the meter adds a unit every time the horn is sounded. As with taxis everywhere in Asia, make sure the meter is turned on when you start. The most reliable taxis seem to be Golden Cabs, but unfortunately there are not many around. Taxis waiting in front of large hotels, bus stations, ports, and airports nearly always have rigged meters. It is usually worth walking to the next street.

4. Trikes: These are bicycles with sidecars for passengers. As transport becomes increasingly motorized, they are becoming rarer even in the provinces. Prices start at about P25 per person for a short trip.

5. Air: International air travel can be arranged from Manila. Airlines connecting Manila with other points in the Far East include Air France, China Airlines, Cathay Pacific, KLM, Korean Airlines, Northwest, Pakistan International, Philippine Air Lines, and Japan Airlines. Northwest has the most flights to the United States. In 1987 there were 87 airports in the Philippines. In addition to the international airports at Manila and Mactan (Cebu), there are four alternative international airports: Laoag City, Ilocos Norte; Davao City; Zamboanga City; and Puerto Princesa City. Philippine Airlines maintains domestic and international air services. The Bureau of Air Transportation implements government policies for the development and operation of a safe and efficient aviation network.

6. Train: Train travel is not recommended because of unsafe roadbeds, substandard cars, and frequent thefts.

7. Boats: Inter-island ships sail almost daily with calls at major Philippine ports. Although accommodations are not first-class, traveling on ships can be adventuresome and enjoyable. However, during peak travel periods, ships are quickly overcrowded. At all times ship travel may be hazardous because of lack of enforcement of safety regulations. Characteristics of normal sea travel in and around the Philippines are:

- As many people as possible crammed into the smallest possible space.
- Bunks welded to every available bit of floor space.
- Overflowing toilets due to no water and overuse.
- Lousy food, very little drink available, and the boat arriving several hours late.
- Nauseated passengers if it is slightly rough.

B. Communications

1. Radio and Television: Radio and television programs in the Philippines resemble those in the United States. They are commercial and highly competitive. Many programs are in English. Many popular U.S. series are carried in English, but many locally produced shows are in Tagalog. Local news and public affairs programs are usually in English. The Philippines currently have about 315 radio stations, with 45 in the metropolitan Manila area. There are also 29 television channels throughout the nation, with 7 in the Manila area. Sky cable TV is also available.

2. Telephone: There are PLDT (Philippines Long Distance Telephone Company) offices in Manila as well as at other central locations. A visitor can also make international calls from the Manila Hilton, but there is a 25 percent surcharge for non-guests. It is far cheaper to make station-to-station rather than person-to-person calls from the Philippines; charges are about 25 percent less. It is best to call outside of business hours (of the country being called) when the waiting time will be considerably less. On Sundays there is a 25 percent reduction in the charge. In the Philippines, the AT&T international access number is 105-11.

In contrast to overseas calls, local calls in the Philippines are difficult. It can take a ridiculously long time to be connected. The lines over long distances are bad; international calls are a breeze in comparison. You cannot find telephones everywhere in the Philippines. In an emergency try the nearest police station, which in many rural areas will have the only telephone for miles around. Telephone numbers are always changing, so check a local directory before calling.

3. Telegrams: The international telegram service is fairly prompt and reliable, but internal telegrams are likely to be delayed. There are several telegram companies. To overseas destinations, 12-hour telegrams cost about P8 per word. Within the Philippines, a telegram to Cebu from Manila, for example, costs about 80 centavos a word and takes five hours. To compare, a telex to Europe costs P60 per minute (= four lines) through Eastern Communications.

4. Postal Service: The Filipino postal system is generally quite efficient. Post offices are closed on Sundays and public holidays. During the Christmas period from mid-December to mid-January, mail is delayed by up to two months. If items such as film are sent by mail, it is best to send it by registered post. Parcels have to be wrapped with brown paper and secured with string. In most hotels there is a packing service for guests, and for a few pesos more, an employee will take the package to the post office. Although the postal service is usually competent, it is not recommended that you send money through the mail. Letters with banknotes inside tend to mysteriously disappear, even if they are registered.

SECTION V: HEALTH

The general level of sanitation in the Philippines is lower than that in the United States, but is high compared with many other developing nations. An increase in Manila's population, as in other urban areas, has greatly overtaxed city water supplies, sewage, garbage disposal, street cleaning, and utilities. Caution must be exercised regarding the public water supplies in the Philippines. At times during the dry season, low main water pressure results in questionable water potability in certain areas. As a general rule, it is advised to boil water before drinking and brushing teeth or use bottled water.

Even in large urban areas such as Manila, open sewers and waste disposal can be found. Food handling and market sanitation practices in some areas may not be adequate from a public health standpoint. Most urban areas are trying to improve city sanitation conditions and educate people in public health and sanitation measures. However, these programs have not reached all levels of the society. Cockroaches, ants, mosquitoes, fleas, termites, rats, and mice abound in the Philippines; and malaria is still a problem in the outlying areas of the nation.

Prevalent diseases of military importance include malaria, all types of diarrheas, typhoid fever, gastroenteritis, hemorrhagic fever, helminthiasis and other parasitic infections, filariasis, schistosomiasis, sexually transmitted diseases, pneumonia, and other respiratory infections. AIDS is also a mounting concern in the Philippines; with no system in place to test the national blood bank, the probability of a rapidly escalating infection rate is high. Another health consideration is the severe climate of the Philippines. The continuous heat and humidity can cause loss of stamina among personnel and increase the deterioration of equipment and other material. Mildew, fungus, and arthropod infestations are also common.

Dangerous flora and fauna abound in and around the Philippine Islands. All plants, animals, and marine life should be considered potentially life threatening until otherwise positively identified. The following is a list of the most prevalent and dangerous flora and fauna: centipedes, black scorpions, black widow spiders, numerous types of cobra, coral and sea snakes, yellow spotted pit viper, speckled pit viper, stonefish, scorpion fish, court cone, sea wasp, jelly fish, zebra fish, gunpowder plant, ligas plant, and lipay plant.

Preventive Measures. The occasional gastrointestinal upsets and colds are almost unavoidable. Through normal precautions and care, serious diseases, such as cholera, typhoid amebiases, bacillary dysentery, and intestinal parasites, are avoidable. Select eating establishments carefully, and drink only bottled water or beverages. Boil all water that is used for cooking or drinking. Prior to entry into the Philippines, personnel should be inoculated against typhoid, tetanus, diphtheria, poliomyelitis, and cholera. The best way to protect against sexually transmitted diseases is abstinence, for even the use of condoms is not 100 percent effective.

SECTION VI: THE ECONOMY

GNP: $53,680,000,000 (1993)
GNP per capita: $740 (1993)
Imports: $16.2 billion - raw materials, capital goods, petroleum products.
Exports: $11.1 billion - electronics, textiles, coconut products, cooper, fish.
Inflation rate (consumer prices): 7.6% (1993)
Unemployment rate: 9.2% (1993)
Budget:
Revenues: $11.5 billion
Expenditures: $13 billion (1994 est.)
External debt: $34.1 billion (Sep 1993)
Electricity: 7,850,000 kW capacity; 28,000 billion kWh produced. Electric current is generally 220 volts, 60 cycles, although the actual voltage is often less, particularly in some provinces. In some areas the standard is a U.S.-style 110-volt current. Although less frequent, brownouts still occur. An adaptor may be needed for Filipino plugs that are usually similar to the U.S. flat two-pin type.

Industries: Textiles, pharmaceuticals, chemicals, wood products, food processing, electronics assembly, petroleum refining, fishing.

Agriculture: Accounts for about 20 percent of the GDP and about 45 percent of the labor force; major crops - rice, coconut, corn, sugarcane, bananas, pineapple, mango; animal products - pork, eggs, beef; net exporter of farm products: fish catch of 2 million metric tons annually.

After several false starts, the Philippine economy is finally poised for a take-off. The country's economic growth for 1994 was 5.1 percent, about double the 1993 growth rate. An indicator of investor enthusiasm is the Philippine stock market, whose performance in 1993 has been described as the best in Asia. The Philippine composite index climbed a staggering 193 percent, the third largest gain in the world. Foreign investments of $522 million in 1993, most from Asians nations, nearly doubled that of 1992. The Philippines has also made significant progress in its relations with Malaysia, ending nearly 30 years of a "cold war" between the two nations. As a result, Malaysia is now the biggest single investor in the Subic Bay Freeport.

The economic resurgence of the Philippines has also attracted other Asian countries, including Japan, China, South Korea, Taiwan, and Singapore. Currently, Japan is the number one investor in the Philippines, having injected about $110 million in 1993, up 65 percent from 1992. Singapore's investment of $38 million in 1993 was an increase of nearly 800 percent over that of 1992.

However, one of the biggest economic problems facing the Philippines is its growing $32 billion foreign debt. Currently, payments to service the foreign debt eat up 43 percent of the national budget. In an effort to relieve this pressure, the Philippine government has been allowed to restructure its debt with its creditors and postpone some payments by 15 to 20 years. Another problem still facing the Philippine economy is trying to deal with the after effects of the U.S. military withdrawal. The Subic Bay Naval Base provided income, either directly or indirectly, for approximately 160,000 Filipinos and their dependents. Prior to the U.S. withdrawal in November 1992, the U.S. government was the second largest employer in the Philippines, second only to the Philippine government.

SECTION VII: INTERNAL AND EXTERNAL THREATS

A. Internal Threat

Instability is a fact of political life in the Philippines. There are basically three groups that continue to disrupt or have the ability to disrupt national peace: the New Peoples Army (NPA), the Muslim separatist movement, and the Reform the Armed Forces Movement (RAM) and Young Officers Union (YOU). Although disruptive, none of these groups has the ability to threaten the current government.

The first and foremost of these groups is the communist-backed insurgency. Jose Maria Sison, who adopted the Maoist revolutionary model as the basis for the insurgency, founded the Communist Party of the Philippines (CPP) in 1968. The CPP's plan was to use its military arm, the NPA, to gradually assume control of the countryside and eventually restrict government influence to urban areas. Once this goal was realized, conventional warfare was to be used to finally defeat government forces. However, the NPA has been unable to acquire sufficient strength and support to overpower the Armed Forces of the Philippines (AFP). In fact, in recent years the NPA numbers have been shrinking due to political compromises by the Philippine government and AFP military successes. Currently, the NPA numbers no more than 7,000 combatants.

A second threat facing the AFP is the Muslim separatist movement centered on the southern island of Mindanao. This movement centers on the Moro National Liberation Front (MNLF) and the Moro Islamic Liberation Front (MILF), which seek Muslim autonomy from the central government. Another extremist Islamic group is the Abu Sayyaf Group (ASG). The ASG mostly confines its actions to random kidnapping and bombings. Although organized resistance fragmented and diminished in the 1980s, in recent years, the number of attacks from Muslim insurgents has increased. The Muslim insurgents number approximately 15,000-19,000 guerrillas.

Still another threat to the Philippine government is the organization of disillusioned former military officers known as the RAM/YOU. The members and supporters of these organizations have been involved in at least seven attempts to overthrow the Philippine government. In recent years, support for their activities has weakened and their numbers have diminished. However, a small cadre of dedicated members remains and still has some potential to reestablish a destabilizing influence in the nation.

B. External Threat

Although the Philippines has been involved in territorial and commercial disputes with several of its neighbors, it currently perceives no major external threat to national security. Its military occupation of, and historical claim to, several Spratly Islands (known to the Philippines as the Kalayaan group), however, could prove to be a future flashpoint between the Philippines and other claimants, such as Vietnam, Malaysia, Taiwan, and the People's Republic of China, especially if a major oil or other commercially exploitable resource is discovered.